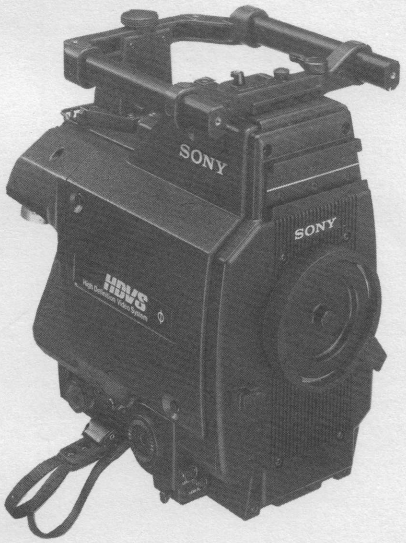
SONY®

HD COLOR CAMERA HEAD

HDC-300



HD CAMERA SIGNAL PROCESSOR

HDCS-300

HD CAMERA OPERATIONAL CONTROL UNIT

HDCO-300

HDVS

MAINTENANCE MANUAL

Volume 1 1st Edition (Revised 2)

Serial No. 10001 and Higher

SAFETY RELATED COMPONENT WARNING

Components identified by shading and ⚠ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

For the customers in the U.S.A.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Important—To insure that the complete system (including this peripheral) is capable of complying with the FCC requirements, it is recommended that the user make sure that the individual equipment of the complete system has a label with one of the following statements.
"This equipment has been tested with a Class A Computing Device and has been found to comply with Part 15 of FCC Rules."
—or—
"This equipment complies with the requirements in Part 15 of FCC Rules for a Class A Computing Device."
—or equivalent.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

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The material contained in this manual consists of information that is the property of Sony Corporation and is intended solely for use by the purchasers of the equipment described in this manual.
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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 7.5 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)

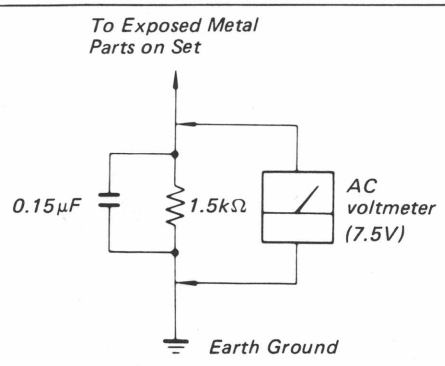

Fig. A. Using an AC voltmeter to check AC leakage.

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HDC-300 (J, E) Volume 2
HDCS-300 (J, E) Volume 2
HDCO-300 (J, E) Volume 2

A. BLOCK DIAGRAMS

B. SEMICONDUCTOR PIN ASSIGNENTS

C. SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

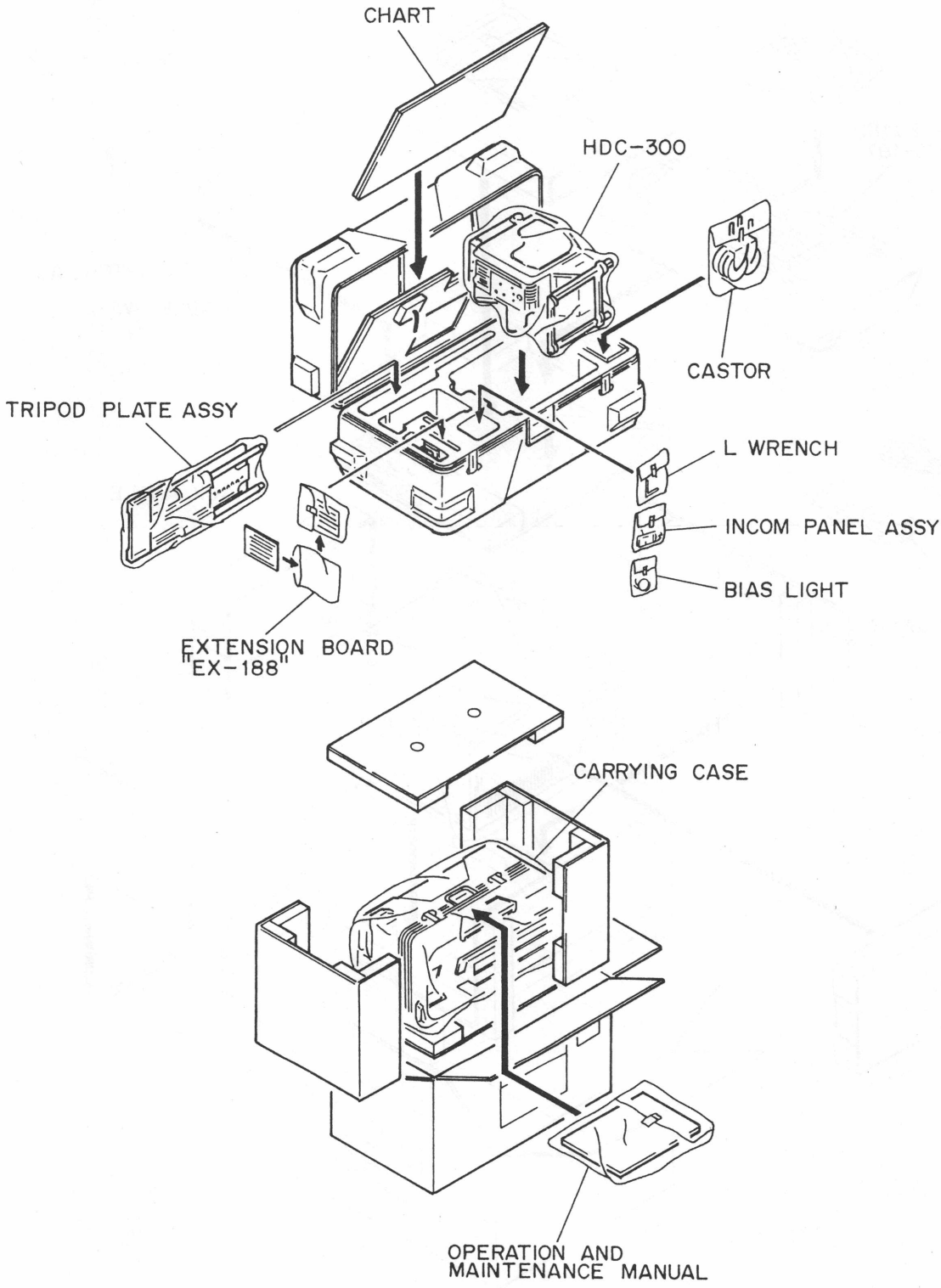
D. SPARE PARTS

E. CHANGED PARTS

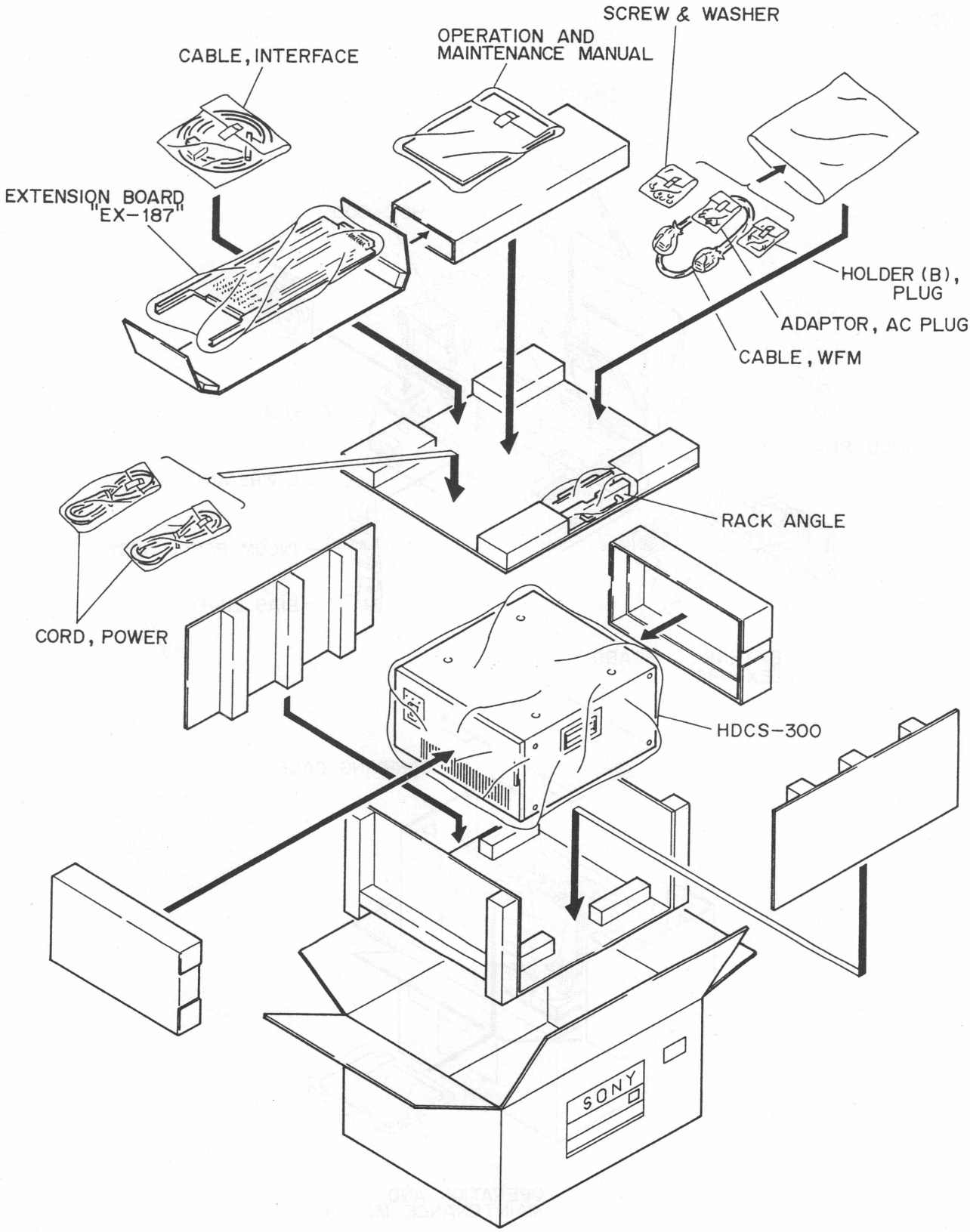
SECTION 1
INSTALLATION

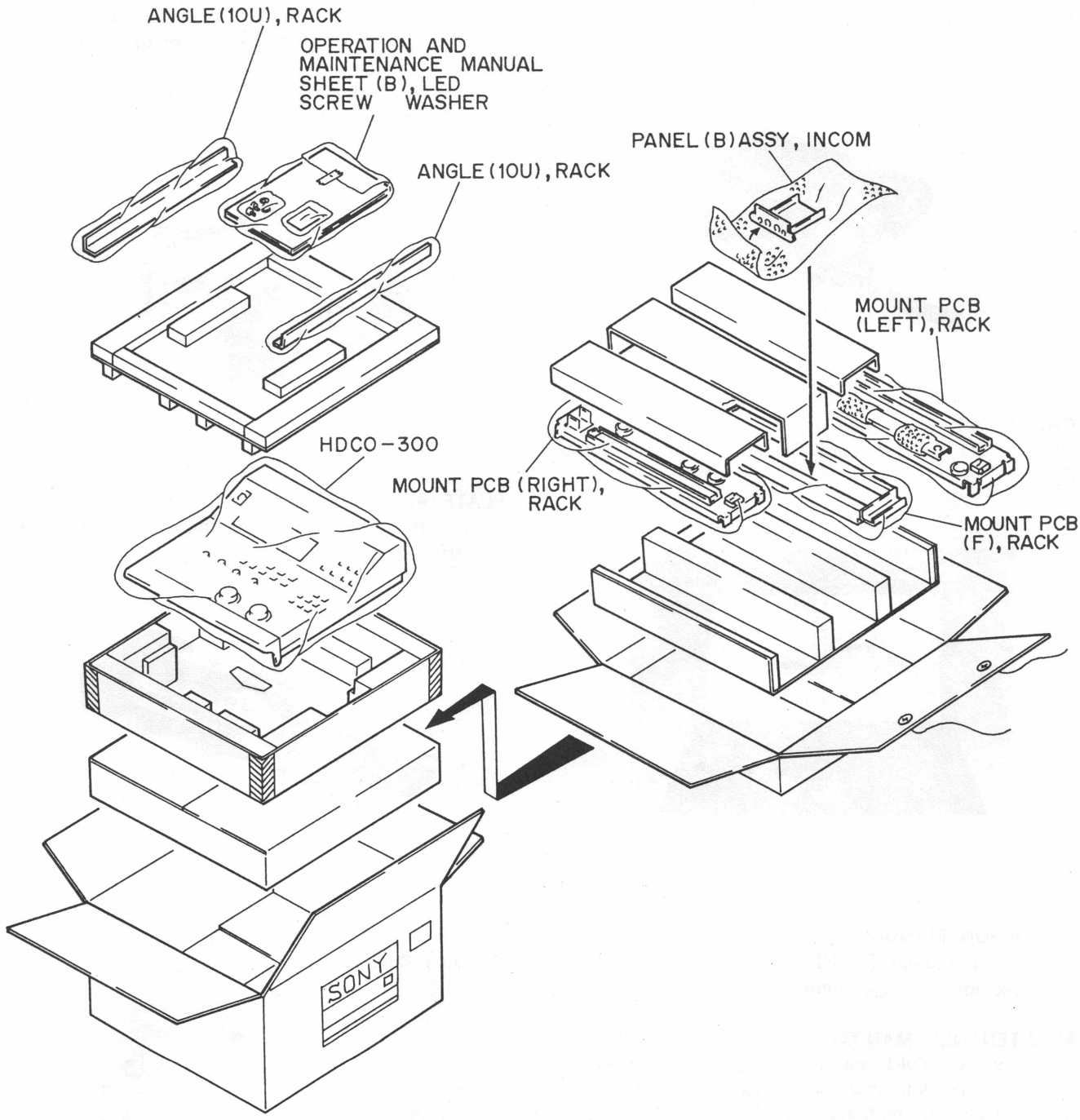
1-1. UNPACKING AND REPACKING

HDC-300



HDCS-300


SCREW & WASHER
OPERATION AND MAINTENANCE MANUAL
CABLE, INTERFACE
EXTENSION BOARD "EX-187"
HOLDER (B), PLUG
ADAPTOR, AC PLUG
CABLE, WFM
RACK ANGLE
CORD, POWER
HDCS-300
SONY


ANGLE (10U), RACK
OPERATION AND MAINTENANCE MANUAL
SHEET (B), LED
SCREW
WASHER
ANGLE (10U), RACK
PANEL (B) ASSY, INCOM
MOUNT PCB (LEFT), RACK
HDCO-300
MOUNT PCB (RIGHT), RACK
MOUNT PCB (F), RACK
SONY

1-2. SUPPLIED ACCESSORIES

HDC-300

Extension Board "EX-188" : × 1
Use this for the check and repair of the main printed boards.

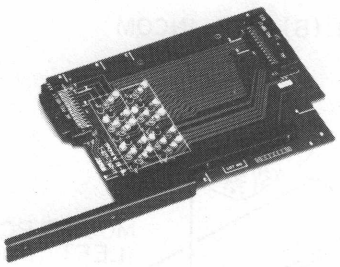
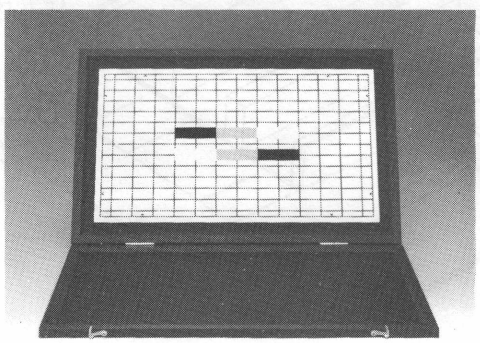


CHART : × 1
Used to set the reference file and automatic setup file.



OPERATION MANUAL : × 2
Instruction manual for HDC-300.
Japanese and English manuals.

MAINTENANCE MANUAL : × 3
Contains two Vol-1 manual and one Vol-2 manual. Two Vol-1 (Japanese and English) carries that maintenance informations of HDC-300, HDCS-300 and HDCO-300.
Vol-2 carries that block diagrams, schematic diagrams and parts informations of HDC-300.

PANEL ASSY, INCOM : × 1
A "Jack, Phone" is installed on the incom panel when shipping at the factory. So, be sure to replace "Jack, Phone" when using the XLR type. As for replacement, refer to "1-6-5. Replacement procedure for XLR type PANEL, INCOM".

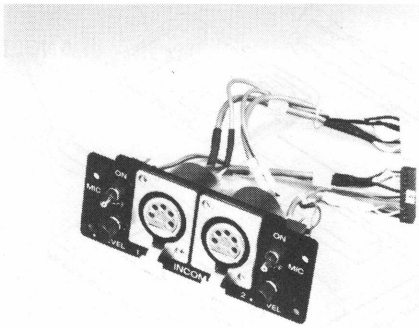
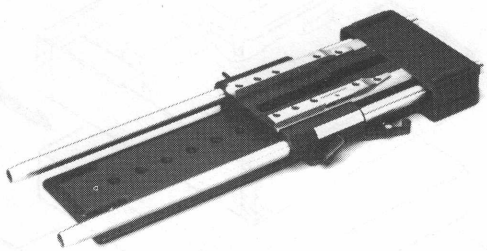
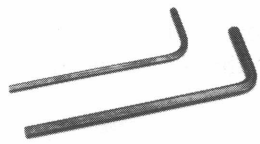


PLATE ASSY, TRIPOD : × 1
This is the fixed mount for the attached camera at the tripod.

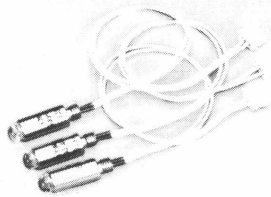


Carrying Case : × 1

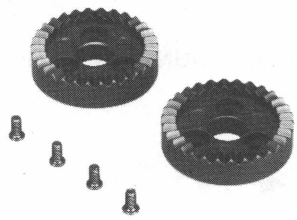
L-shaped Hexagonal Wrench (3mm) : × 1
(2mm) : × 1
Used for fixing or removing screw of the handle assy.



BIAS LIGHT : × 3
Used to replace the bias light installed on the prism on the front panel.

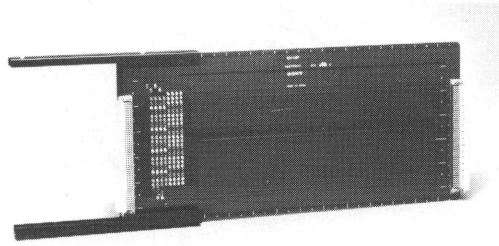


BRACKET, ADJUSTMENT, ANGLE : × 2
SCREW + P2.6 × 5 : × 4

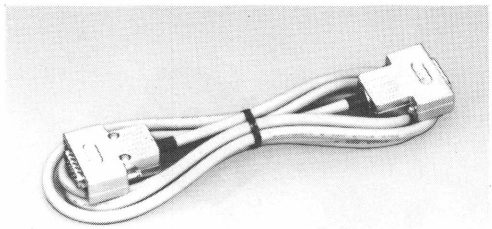


HDCS-300

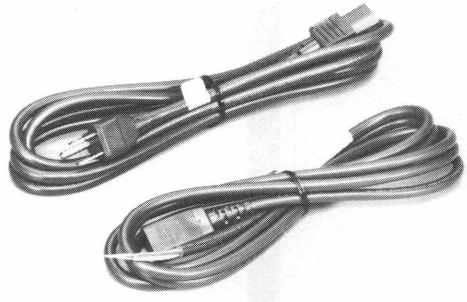
Extension Board "EX-187" : × 1
Use this for the check and repair of the main printed boards.



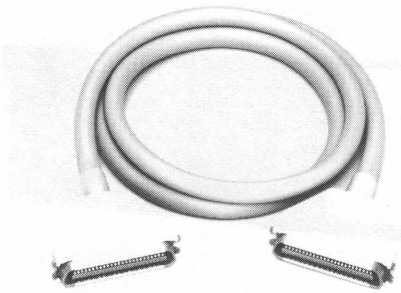
WFM CABLE : × 1
This cable is connected to the 1730HD waveform monitor manufactured by TEKTRONIX INC.



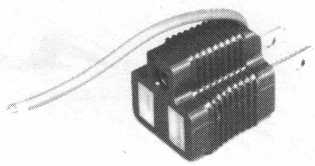
POWER CORD : × 2
The power cord with a 3P plug and the power cord without a plug are supplied. Use one of them according to the power outlet to be used.



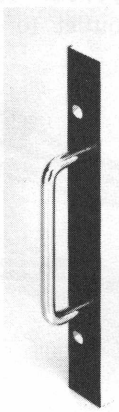
INTERFACE CABLE : × 1
Used to connect between the HDCS-300 and the HDCO-300.
The length is 1.5m.



AC PLUG ADAPTOR 3P-2P : × 1
Used to connect the power cord with a 3P plug to the power outlet for 2 pins.



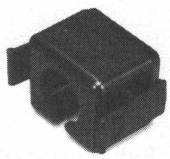
RACK ANGLE (5U) ASSY : × 2
Used to install the equipment on the 19-inch rack. As for installation, refer to the section 1-6-3. Installation of HDCS-300 and HDCO-300.



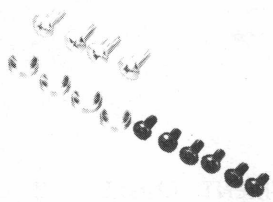
OPERATION MANUAL : × 2
Instruction manual for HDCS-300.
Japanese and English manuals.

MAINTENANCE MANUAL : × 1
Contains the HDCS-300 block diagrams, circuit diagrams, and repair parts maintenance information.

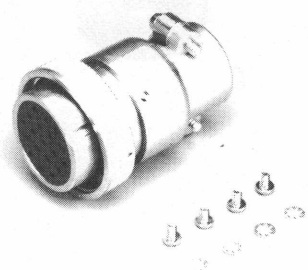
PLUG HOLDER (B) : × 1
Used to prevent the AC cord from coming off.



WASHER, ORNAMENTAL : × 4
SCREW + **RK5** × **14** : × 4
+ **B 4** × **8** : × 6

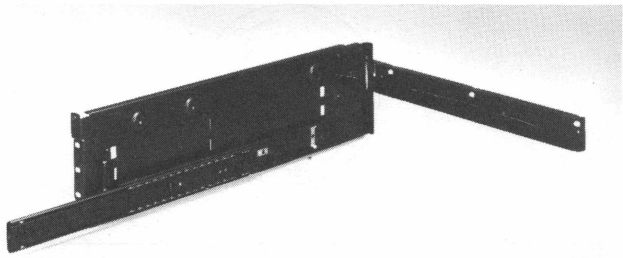


PLUG CONNECTOR (ROUND) (F) 19P : × 1

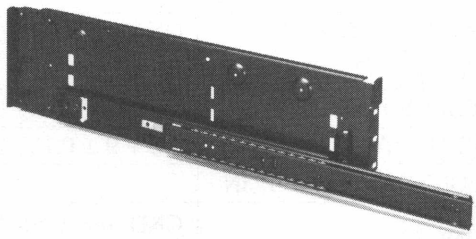


HDCO-300

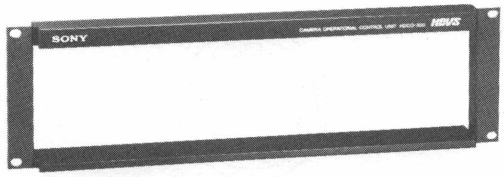
RACK MOUNT (L) ASSY : × 1
Used to install the equipment on the 19-inch rack. As for installation, refer to the section 1-6-3. Installation of HDC-300 and HDCS-300.



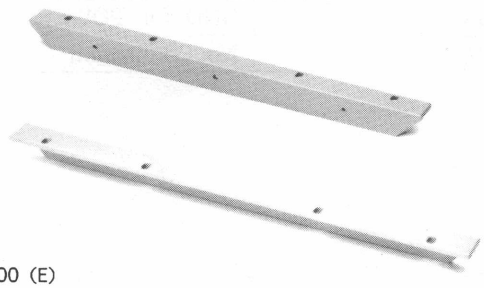
RACK MOUNT (R) ASSY : × 1
Used to install the equipment on the 19-inch rack. As for installation, refer to the section 1-6-3. Installation of HDC-300 and HDCS-300.



RACK MOUNT (F) ASSY : × 1
Used to install the equipment on the 19-inch rack. As for installation, refer to the section 1-6-3. Installation of HDC-300 and HDCS-300.



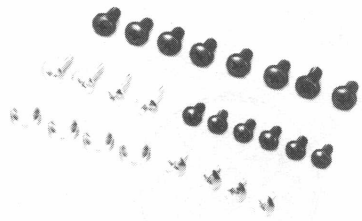
RACK ANGLE (10U) : × 2
Used to secure the equipment on the table.
As for securing, refer to the section 1-6-3. Installation of HDC-300 and HDCS-300.



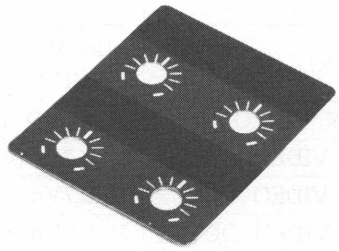
OPERATION MANUAL : × 2
Instruction manual for HDCO-300.
Japanese and English manuals.

MAINTENANCE MANUAL : × 1
Contains the HDCO-300 block diagrams, circuit diagrams, and repair parts maintenance information.

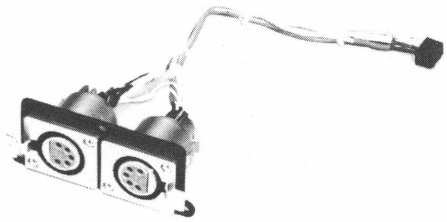
SCREW + **RK5** × **8** : × 4
+ **RK5** × **14** : × 4
+ **B4** × **8** : × 6
+ **B5** × **10** : × 8
WASHER, ORNAMENTAL : × 4



LED SHEET (B) : × 1



INCOM PANEL ASSY : × 1
A "Jack, Phone" is installed on the incom panel when shipping at the factory. So, be sure to replace "Jack, Phone" when using the XLR type. As for replacement, refer to "1-6-5. Replacement procedure for XLR type PANEL, INCOM".



1-3. CONNECTORS/CABLE

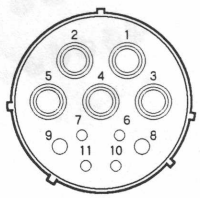
1-3-1. Connector Input/Output signals

The main connector input/output signals are as follows ;

HDC-300

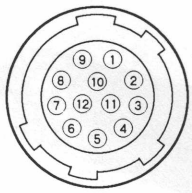
MONITOR BNC-type 75 Ω
VBS 1 Vp-p
INCOM-1/-2 Phone Jack Big type No. 110 type
Input Impedance 5 to 10 kΩ
Output Impedance 300 Ω Balanced
Input Level 200 mVp-p (1 kHz)
Output Level Max. 1.7 Vp-p (1 kHz)

CCU (11P, MALE)



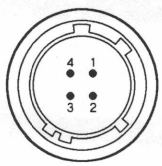
Pin No	SIGNAL	REMARK for SIGNAL
1	COMMAND IN	SERIAL DATA for CAMERA Control
2	RETURN VIDEO IN	Zi = 75 Ω 1.0Vp-p
3	R (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
4	G (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
5	B (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
6	⊕POWER SENSE OUT	DC + 10.6V~+ 25V
7	⊖POWER SENSE OUT	
8	REG (+ 17V) IN	DC + 10.6V~+ 25V 3A
9	GND (+ 17V)	
10	+ 150V IN	DC + 100V~+ 200V
11	+ 150V (GND)	

VF-1/-2 (12P, FEMALE)



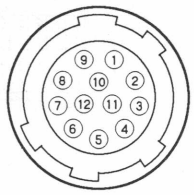
Pin No	SIGNAL	REMARK for SIGNAL
1	AUTO BUSSY	
2	UNREG (+ 12V) IN	DC10.5V~17V, 2A
3	VF VIDEO OUT (1) (G)	VBS 1Vp-p, 75 Ω
4	VF VIDEO OUT (1) (X)	
5	PEAKING ON/$\overline{\text{OFF}}$	ON + 5V OFF 0V
6	BRIGHT CONT IN	0~+ 5Vdc
7	TALLY-1 IN	DC + 5V : ON
8	VF (+ 9V) IN	DC + 9 ± 0.1V, 2A
9	CONTRAST CONT IN	
10	UNREG (GND) IN	GND for UNREG (+ 12V)
11	GND	GND for Signal
12	TALLY-2 IN	DC + 5V : ON

VF-POWER (4P, FEMALE)



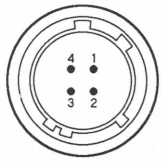
Pin No	SIGNAL	REMARK for SIGNAL
1	+ 150V OUT	DC + 100V~200V, 0.5A
2	POWER REQUEST	0~+ 5Vdc
3	GND	GND for POWER
4	(Spare)	No Connection

LENS (12P, FEMALE)



Pin No	SIGNAL	REMARK for SIGNAL
1	DISTORTION	0~+5Vdc
2	SIGNAL GND	GND for SIGNAL
3	POWER GND	GND for POWER
4	ZOOM CONT/POSI	0~+5Vdc
5	IRIS CONT/POSI	0~+5Vdc
6	+POWER	+10.6V~+25V
7	FOCUS POSI	0~+5Vdc
8	D-COMMAND C→L	+5Vp-p
9	D-COMMAND L→C	
10	R REGISTRATION	0~+5Vdc
11	B REGISTRATION	
12	FOCUS CONT	0~+5Vdc

LENS-POWER (4P, FEMALE)

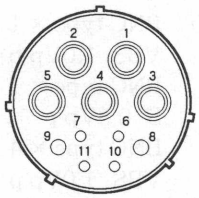


Pin No	SIGNAL	REMARK for SIGNAL
1	+150V OUT	DC+100V~+200V, 0.5A
2	POWER REQUEST	0~+5Vdc
3	GND	GND for +150V
4	(Spare)	No Connection

HDCS-300

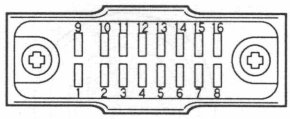
WF R/G/B OUT	BNC-type × 1 VBS 1.0Vp-p
WF SYNC OUT	BNC-type × 1 S 0.3Vp-p
R/G/B OUT	BNC-type × 4 VBS 1.0Vp-p
SYNC OUT	BNC-type × 4 BS 0.45Vp-p (B = 0.3Vp-p, S = 0.3Vp-p)
Y OUT	BNC-type × 2 VB 0.7Vp-p VBS 1.0Vp-p
GENLOCK IN	BNC-type × 2 BS 0.45Vp-p (B = 0.3Vp-p, S = 0.3Vp-p)
RETURN VIDEO	BNC-type × 2 75 Ω
1/2 IN	VBS 1.0Vp-p
PIC MONI OUT-VIDEO	BNC-type × 1 VBS 1.0Vp-p

CAMERA (11P, MALE)



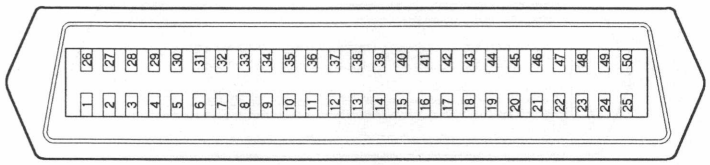
Pin No	SIGNAL	REMARK for SIGNAL
1	COMMAND IN	SERIAL DATA for CAMERA Control
2	RETURN VIDEO IN	Zi = 75 Ω 1.0Vp-p
3	R (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
4	G (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
5	B (VA) VIDEO OUT	V 0.7Vp-p, 75 Ω
6	⊕POWER SENSE OUT	DC + 10.6V~+ 25V
7	⊖POWER SENSE OUT	
8	REG (+ 17V) IN	DC + 10.6V~+ 25V 3A
9	GND (+ 17V)	
10	+ 150V IN	DC + 100V~+ 200V
11	+ 150V (GND)	

RCP (16P, FEMALE)



Pin No	SIGNAL	REMARK for SIGNAL
1	CABLE SHIELD	
2	GND	
3	(Spare)	No Connection
4	(Spare)	No Connection
5	(Spare)	No Connection
6	CCU-RCP DATA (X)	2.0Vp-p Termination 200 Ω ON
7	CCU-RCP DATA (Y)	
8	CCU-RCP DATA (G)	
9	+ 20V OUT	DC + 20V ± 0.5V
10	GND	GND for + 20V
11	(Spare)	No Connection
12	(Spare)	No Connection
13	(Spare)	No Connection
14	RCP PD IN (X)	2.0Vp-p Termination 200 Ω ON
15	RCP XRD IN	
16	RCP PD IN (G)	GND for RCP PD

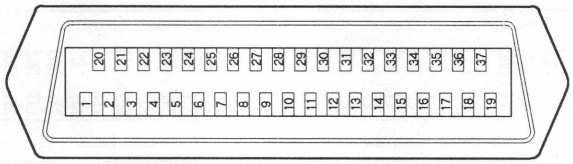
CONTROL UNIT (50P, D-SUB)



Pin No	SIGNAL	REMARK for SIGNAL
1	GND	GND for signal and power
26	GND	
2	GND	
27	GND	
3	GND	
28	GND	
4	GND	
29	GND	
5	+ 20V OUT	DC + 20V ± 0.5V
30	+ 20V OUT	
6	+ 20V OUT	
31	+ 20V OUT	
7	+ 20V OUT	
32	+ 20V OUT	
8	+ 20V OUT	
33	+ 20V OUT	
9	CCU POWER REMOTE (X) IN	ON : SHORT OFF : OPEN
34	CCU POWER REMOTE (Y) IN	
10	CP TALK1 IN (X)	− 10dBm, 600 Ω
35	CP TALK1 IN (Y)	
11	CP TALK1 IN (G)	
36	CP REC1 OUT (X)	− 10dBm, 600 Ω
12	CP REC1 OUT (Y)	
37	CP REC1 OUT (G)	
13	CP TALK2 IN (X)	− 10dBm, 600 Ω
38	CP TALK2 IN (Y)	
14	CP TALK2 IN (G)	
39	CP REC2 OUT (X)	− 10dBm, 600 Ω
15	CP REC2 OUT (Y)	
40	CP REC2 OUT (G)	

Pin No	SIGNAL	REMARK for SIGNAL
16	SCDB17 (I/O)	2.0Vp-p Termination 200 Ω ON
41	SCDB16 (REQ)	
17	SCDB15 (C/D)	
42	SCDB14 (SEL)	
18	SCDB13 (MSG)	
43	SCDB12 (RST)	
19	SCDB11 (ACK)	
44	SCDB10 (BSY)	
20	SCDB9 (ATZ)	
45	SCDB8 (P)	
21	SCDB7	
46	SCDB6	
22	SCDB5	
47	SCDB4	
23	SCDB3	
48	SCDB2	
24	SCDB1	
49	SCDB0	
25	GND	GND for signal and power
50	GND	

POWER (37P, D-SUB)



Pin No	SIGNAL	REMARK for SIGNAL
1	GND	GND for POWER
20	GND	
2	GND	
21	GND	
3	+ 20V IN	DC + 20V ± 0.5V 5A
22	+ 20V IN	
4	+ 20V IN	
23	+ 20V IN	
5	DC ON OUT	ON : GND, OFF : OPEN
24	HT ON OUT	
6	CCU POWER REMOTE OUT(X)	ON : GND OFF : OPEN
25	CCU POWER REMOTE OUT(Y)	
7	FAN (X)	DC + 12V
26	FAN (Y)	
8	(Spare)	No Connection
27	(Spare)	
9	GND	DC + 5V ± 0.05V 5A
28	+ 5V IN	
10	GND	
29	+ 5V IN	
11	GND	
30	+ 5V IN	

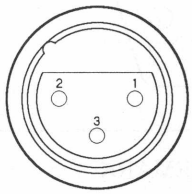
Pin No	SIGNAL	REMARK for SIGNAL
12	GND	DC − 5.2 ± 0.05V 12A
31	− 5.2V IN	
13	GND	
32	− 5.2V IN	
14	GND	
33	− 5.2V IN	
15	(Spare)	No Connection
34	CHU HT OUT (G)	DC + 150V (+ 100～+ 200V)
16	CHU HT OUT (X)	
35	CHU + SENSE IN	+ 17Vdc ± 2V
17	CHU + 17V OUT	DC + 17V ± 0.1V 2A
36	CHU + 17V OUT	
18	CHU GND	
37	CHU GND	
19	CHU − SENSE IN	0～− 2Vdc

PIC MONI OUT-TALLY (XLR-7, FEMALE)

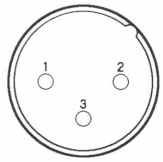
Pin No	SIGNAL	REMARK for SIGNAL
1	(Spare)	No Connection
2	(Spare)	No Connection
3	R TALLY OUT	
4	TALLY COMMON	
5	G TALLY OUT	
6	TALLY COMMON	
7	(Spare)	No Connection

LINE IN/OUT

LINE IN
(3P, FEMALE)

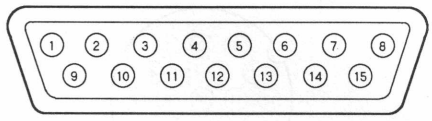


LINE OUT
(3P, MALE)



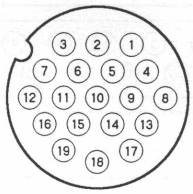
Pin No	SIGNAL	REMARK for SIGNAL
1	RST (GND)	1.0Vp-p
2	RST (1)	
3	RST (2)	

WF CONT (15P, FEMALE)



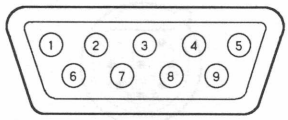
Pin No	SIGNAL	REMARK for SIGNAL
1	LINE/X・FIELD	LINE 5Vdc FIELD 0Vdc
2	X・FOUR OUT	FOUR 0Vdc
3	ONE/X・IWO OUT	ONE 5Vdc IWO 0Vdc
4	REMOTE X・ENB OUT	REMOTE 5Vdc ENB 0Vdc
5	RECALL 1 OUT	RECALL 5Vdc
6	X・STORE OUT	STORE 0Vdc
7	RECALL 0 OUT	RECALL 5Vdc
8	X・THREE OUT	THREE 0Vdc
9	GND	GND for signal
10	REMOTE SYNC OUT	REMOTE SYNC 5Vdc
11	X BOTH OUT	BOTH 0Vdc
12	CH1-X・ON OUT	CH1, CH2, CH3 } 0Vdc
13	CH2-X・ON OUT	
14	CH3-X・ON OUT	
15	A/X・B OUT	A 5Vdc B 0Vdc

INCOM/TALLY/PGM (19P, MALE)



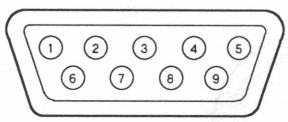
Pin No	SIGNAL	REMARK for SIGNAL
1	PGM IN (X)	− 20dBs/0dBm (Selectable)
2	PGM IN (Y)	
3	PGM IN (G)	
4	RED TALLY IN (X)	ON : 12Vdc, SHORT OFF : 0Vdc, OPEN
5	RED TALLY IN (Y)	
6	GREEN TALLY IN (X)	ON : 12Vdc, SHORT OFF : 0Vdc, OPEN
7	GREEN TALLY IN (Y)	
8	ENG OUT (X)	0dBm
9	ENG OUT (Y)	
10	GND	GND for ENG/PD
11	PD OUT (X)	0dBm
12	PD OUT (Y)	
13	ENG IN (X)	0dBm
14	ENG IN (Y)	
15	PD IN (X)	0dBm
16	PD IN (Y)	
17	ENG IN (G)	GND for ENG
18	(Spare)	No Connection
19	PD IN (G)	GND for PD

EXT IN (9P, FEMALE)



Pin No	SIGNAL	REMARK for SIGNAL
1	FG	GND (FRAME)
2	EXT XRX IN	5.0Vp-p
3	EXT RX IN	
4	EXT RX COMMON	
5	(Spare)	No Connection
6	EXT TX COMMON	5.0Vp-p
7	EXT XTX OUT	
8	EXT TX OUT	
9	FG	GND (FRAME)

CCU (9P, FEMALE)

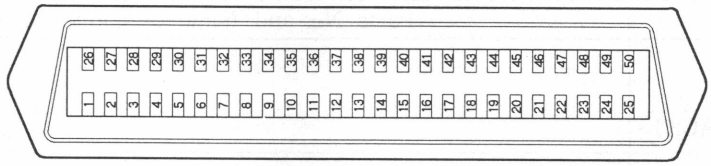


Pin No	SIGNAL	REMARK for SIGNAL
1	FG	GND (FRAME)
2	CCU XRX IN	5.0Vp-p
3	CCU RX IN	
4	CCU RX COMMON	
5	(Spare)	No Connection
6	CCU TX COMMON	5.0Vp-p
7	CCU XTX OUT	
8	CCU TX OUT	
9	FG	GND (FRAME)

HDCO-300

INCOM-1/-2 Phone Jack Big type No.110 type
Input Impedance 5 to 10k Ω
Output Impedance 300 Ω Balanced
Input Level 1kHz 200mVp-p
Output Level 1kHz Max. 1.7Vp-p

SIGNAL PROCESSOR (50P, D-SUB)



Pin No	SIGNAL	REMARK for SIGNAL
1	GND	GND for signal and power
26	GND	
2	GND	
27	GND	
3	GND	
28	GND	
4	GND	
29	GND	
5	+ 20V IN	DC + 20V ± 0.5V 5A
30	+ 20V IN	
6	+ 20V IN	
31	+ 20V IN	
7	+ 20V IN	
32	+ 20V IN	
8	+ 20V IN	
33	+ 20V IN	
9	CCU POWER REMOTE (X) OUT	0～+ 5Vdc
34	CCU POWER REMOTE (Y) OUT	
10	CP TALK 1 OUT (X)	− 10dBm, 600 Ω
35	CP TALK 1 OUT (Y)	
11	CP TALK 1 OUT (G)	
36	CP REC 1 IN (X)	− 10dBm, 600 Ω
12	CP REC 1 IN (Y)	
37	CP REC 1 IN (G)	

Pin No	SIGNAL	REMARK for SIGNAL
13	CP TALK 2 OUT (X)	− 10dBm, 600 Ω
38	CP TALK 2 OUT (Y)	
14	CP TALK 2 OUT (G)	
39	CP REC 2 IN (X)	− 10dBm, 600 Ω
15	CP REC 2 IN (Y)	
40	CP REC 2 IN (G)	
16	SCDB17 (I/O)	2.0Vp-p Termination 200 Ω ON
41	SCDB16 (REQ)	
17	SCDB15 (C/D)	
42	SCDB14 (SEL)	
18	SCDB13 (MSG)	
43	SCDB12 (RST)	
19	SCDB11 (ACK)	
44	SCDB10 (BSY)	
20	SCDB9 (ATZ)	
45	SCDB8 (P)	
21	SCDB7	
46	SCDB6	
22	SCDB5	
47	SCDB4	
23	SCDB3	
48	SCDB2	
24	SCDB1	
49	SCDB0	
25	GND	GND for signal and power
50	GND	

1-3-2. Connector

When cable with connectors are set to the respective connectors on the connector panel during installation or service, the specified or equivalent connectors with cables, or the specified cable assemblies should be used, these are listed as follows ;

HDC-300

Connector function	Parts No. and name of connector with cable
INCOM-1 INCOM-2 (JACK)	
MONITOR (BNC)	1-508-898-00 PLUG, BNC or UGC (B-B) COAXIAL Cable assembly (optional) UGC-0.5 (0.5m/1.6 feet) UGC-1 (1m/3.2 feet) UGC-2 (2m/6.4 feet) UGC-5 (5m/16.4 feet) UGC-10 (10m/32.8 feet) UGC-25 (25m/82 feet)
CAMERA (11P, MALE)	1-564-916-11 HDCC PLUG, 11P, FEMALE 1-564-914-11 HDCC PLUG, 11P, MALE 7-613-099-30 TV CCX CABLE or HDCC cable assembly HDCC-2 (2m/6.4 feet) HDCC-5 (5m/16.4 feet) HDCC-50 (50m/164 feet) (optional) HDCC-100 (100m/328 feet) (optional)
VF-1/-2 (12P, FEMALE)	1-568-233-11 CONNECTOR, ROUND TYPE, 12P MALE 1-574-495-11 CABLE ASSY (Supplied with HKCF-75) 1-558-612-11 CABLE ASSY (Supplied with HDVF-30)
VF-POWER (4P, FEMALE)	1-566-425-21 4P MALE 1-574-432-11 CABLE ASSY (Supplied with HKCF-75) HR-10A-7P-4P or equivalent HR-10A-7P-4PB or equivalent
LENS (12P, FEMALE)	1-568-233-11 CONNECTOR ROUND TYPE, 12P MALE
LENS-POWER (4P, FEMALE)	1-566-425-21 CONNECTOR, ROUND TYPE, 4P MALE HR-10A-7P-4P or equivalent HR-10A-7P-4PB or equivalent

HDCS-300

Connector function	Parts No. and name of connector with cable
WF R, G, B OUT WF SYNC OUT R, G, B OUT SYNC OUT Y OUT GENLOCK IN RETURN VIDEO 1, 2 IN PIC MONI OUT-VIDEO (BNC)	1-508-898-00 PLUG, BNC or UGC (B-B) COAXIAL cable assembly (optional) UGC-0.5 (0.5m/1.6 feet) UGC-1 (1m/3.2 feet) UGC-2 (2m/6.4 feet) UGC-5 (5m/16.4 feet) UGC-10 (10m/32.8 feet) UGC-25 (25m/82 feet)
HDCO (50P, D-SUB)	1-556-664-11 CABLE, INTERFACE (cable length 1.5m, supplied with HDCS-300)
PIC MONI OUT-TALLY (XLR-7-31F77, FEMALE)	1-508-373-11 XLR-7-12C, MALE
LINE IN (3P, FEMALE)	1-508-083-11 XLR-3P, MALE or CANNON XLR 3-12C
LINE OUT (3P, MALE)	1-508-084-11 XLR-3P, FEMALE or CANNON XLR-3-11C
WF CONT (15P, FEMALE)	1-566-355-11 D-SUB, 15P, MALE JAE DAU-15SF-FO HRS CDA-15PF (05) CABLE 1-574-531-11 (Supplied with HDCS-300)
INCOM/TALLY/PGM (19P, MALE)	1-506-767-11 MULTI 19P FEMALE (supplied with HDCS-300)
EXT IN CCU (9P, FEMALE)	1-566-354-11 D-SUB, 9P MALE
RCP (16P, FEMALE)	1-564-970-11 PLUG, 16P, MALE (P-1616G-C or equivalent)

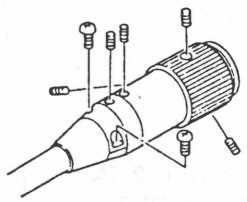
HDCO-300

Connector function	Parts No. and name of connector with cable
SIGNAL PROCESSOR (50P, D-SUB)	1-556-664-11 CABLE, INTERFACE (cable length 1.5m, supplied with HDCS-300)
INCOM-1 IN/OUT INCOM-2 IN/OUT (JACK)	

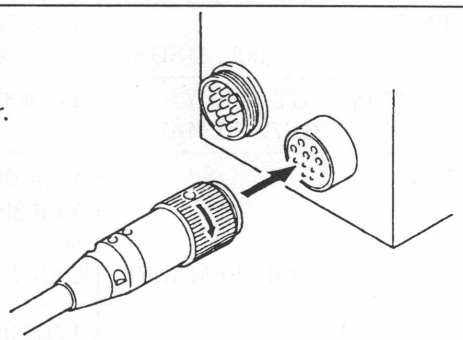
Note : The plug of the interface cable connecting "HDCO" of the HDCS-300 and "SIGNAL PROCESSOR" of the HDCO-300 cannot be replaced.

1-3-3. Removal of the HDCC Connectors

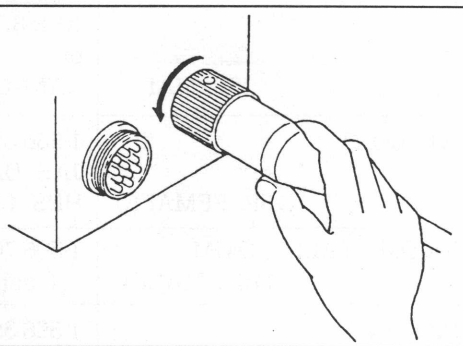
Step 1.
Remove the five hexagonal setscrews and the two setscrews.



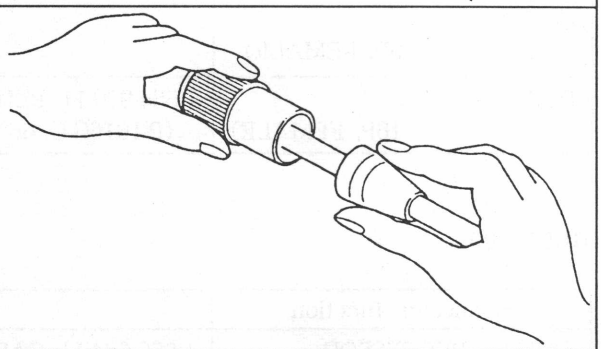
Step 2.
Fix the HDCC connector to the camera or the signal processor.



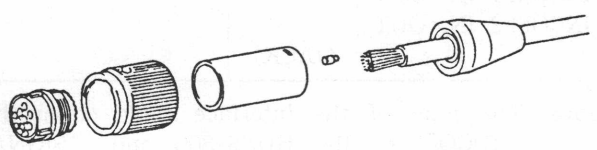
Step 3.
Rotate the HDCC connector counterclockwise and loosen it.



Step 4.
It can be removed by hand and unsolder.

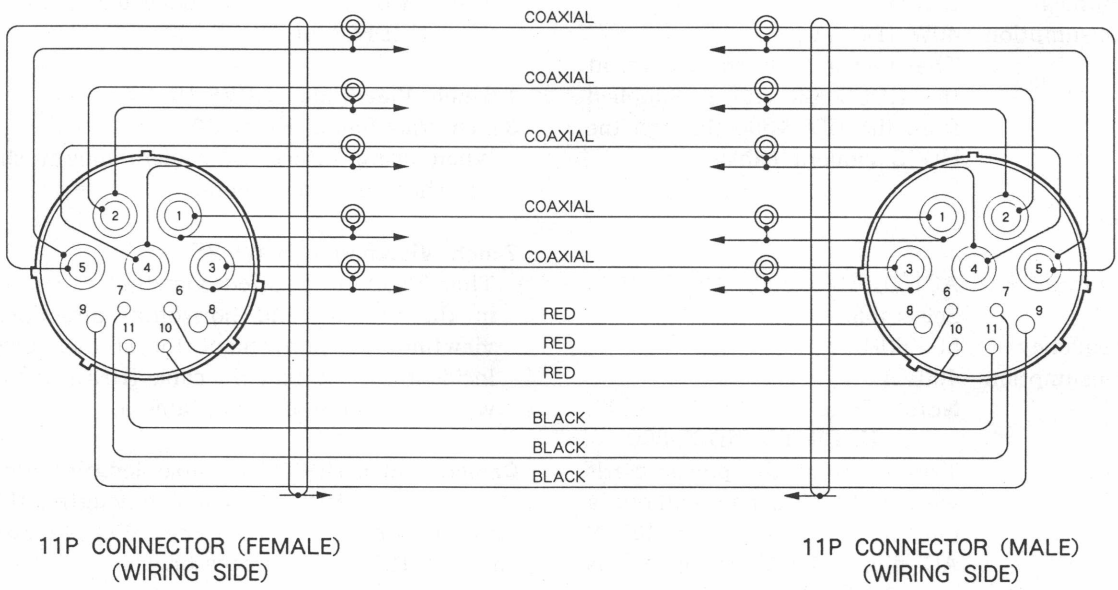


Step 5.
It can be broken up as shown in Figure.

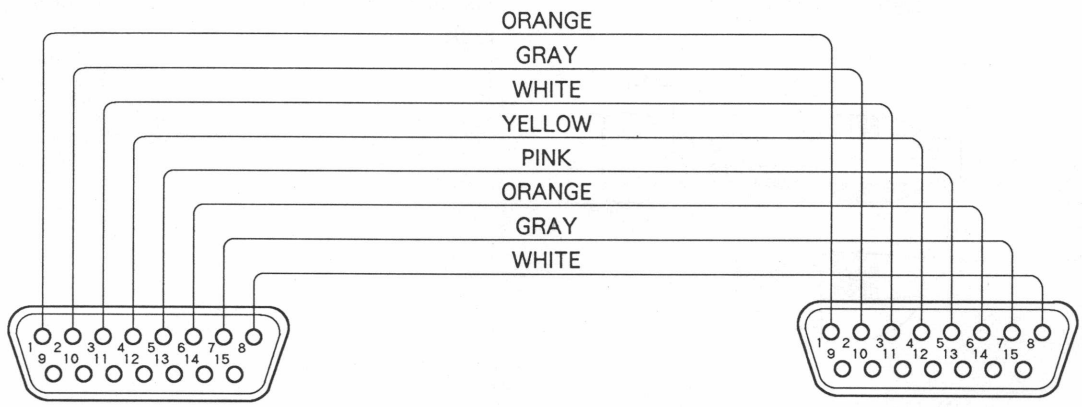


1-3-4. Cable wiring

HDCC Cable (wiring diagram)



WF Cable (wiring diagram)



1-4. POWER SUPPLY

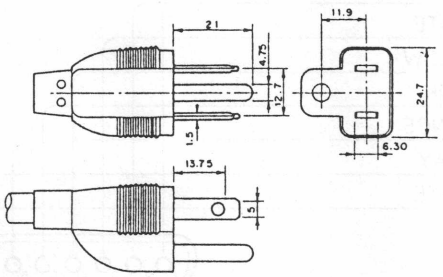
HDC-300

Power Sources	DC17V
Power consumption	40W (DC17V)
	The power voltage occurs at the HDCS-300 and is supplied from the HDCS-300 through the HDCC camera cable.

HDCS-300

Power sources	AC100/120/220/240V ± 10% Selectable
Power frequency	50/60Hz
Power consumption	400VA
	Note : Total of the HDC-300, HDCS-300, HDCO-300
Power cord	Two types of the power cords with a 3P plug and without a plug are supplied. The 3P-2P AC plug adaptor (supplied) is used for the 2P outlet.

1) 3P plug
   Cable length about 2.7m
   Rated voltage 120V
   Rated current 7A



2) No plug
   Cable length about 3m
   Rated voltage 250V
   Rated current 6A

HDCO-300

Power sources	DC + 20V
	DC20V voltage are supplied from the HDCS-300 through the interface cable and + 15V, + 7V and + 5V occur at each series regulator of the CP-130 board.

1-5. OPTIONAL ACCESSORIES

9-inch monochrome monitor HDM-90
14-inch monochrome monitor HDM-145
These two monitors are connected to the PIC MONI OUT (VIDEO) of HDCS-300.

1.5-inch Viewfinder HDVF-15
3-inch Viewfinder HDVF-30
When using, insert the camera mount shoe to the VF shoe on the camera.

7-inch Viewfinder HDVF-75
This 7-inch large-sized viewfinder can be panned in the vertical and horizontal directions, so this viewfinder is convenient for studios use.
Incidentally, the pan tilt cable (HKCF-75) is required when installing on the camera.

Camera cable HDCC-50 (cable length : 50m)
HDCC-100 (cable length : 100m)
Used to connect between the HDC-300 camera head and the HDCS-300 processor.

Rack mount plate kit HKCF-90
Used to install the HDM-90 9-inch monochrome monitor and the 1730HD waveform monitor manufactured by TEKTRONIX, Inc. onto the system rack.

1-6. INSTALLATION

1-6-1. Installation Conditions

Operating temperature : 0℃ to 40℃
Storage temperature : − 20℃ to + 40℃
Humidity : 0% to 40%

- Install in a location as dry and well-ventilated as possible.
- WAllow adequate air circulation to prevent internal heat build-up. Do not place the unit on an uneven surface (rug, blanket, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near a heat source such as a radiator or air duct, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position only.
- Keep the unit away from equipment with strong magnetic fields.

HDCS-300/HDCO-300

- Provide a space of 20cm or more behind the connector panel.
- Install the unit so that neither cable nor any other object touches the net of the fan at the rear.

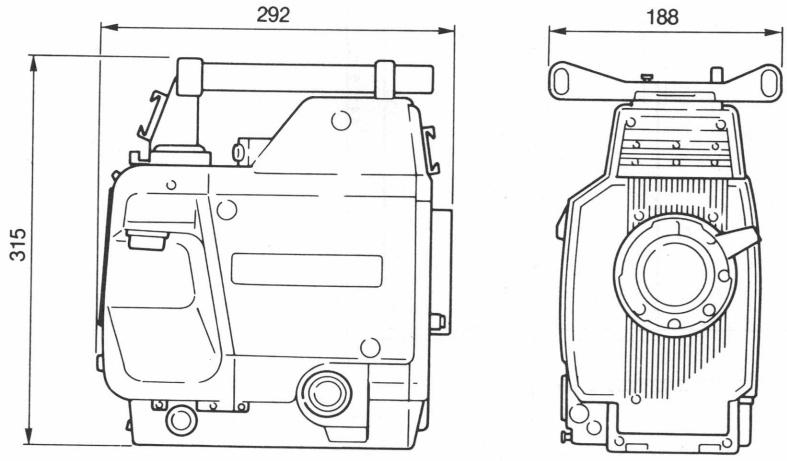
HDC-300

- To prevent the camera tube from burning, do not point the lens directly toward the sun or a strong light source.
- Warm up the unit for approx. 10 minutes before using it.

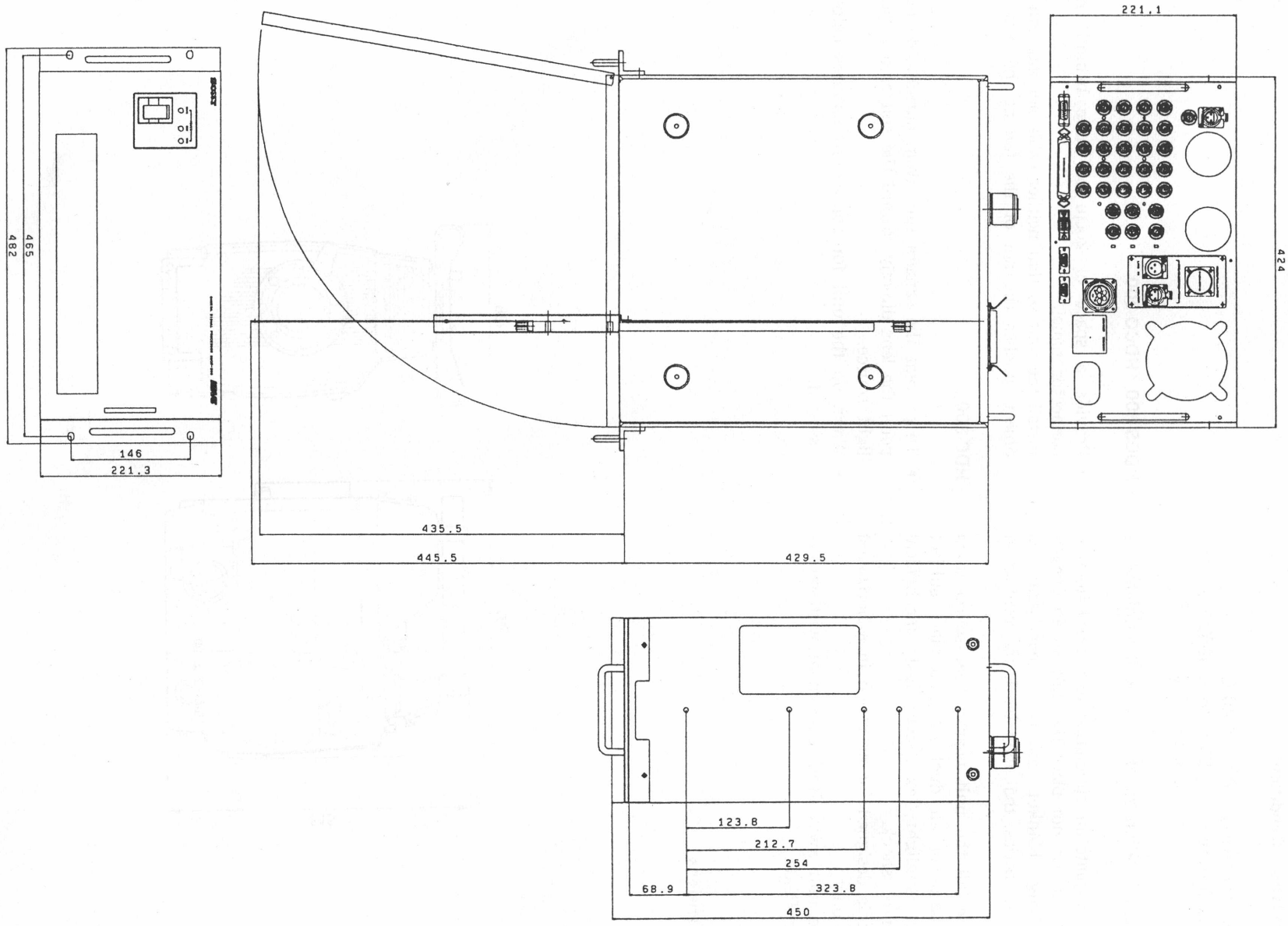
1-6-2. Dimensions

Unit : mm

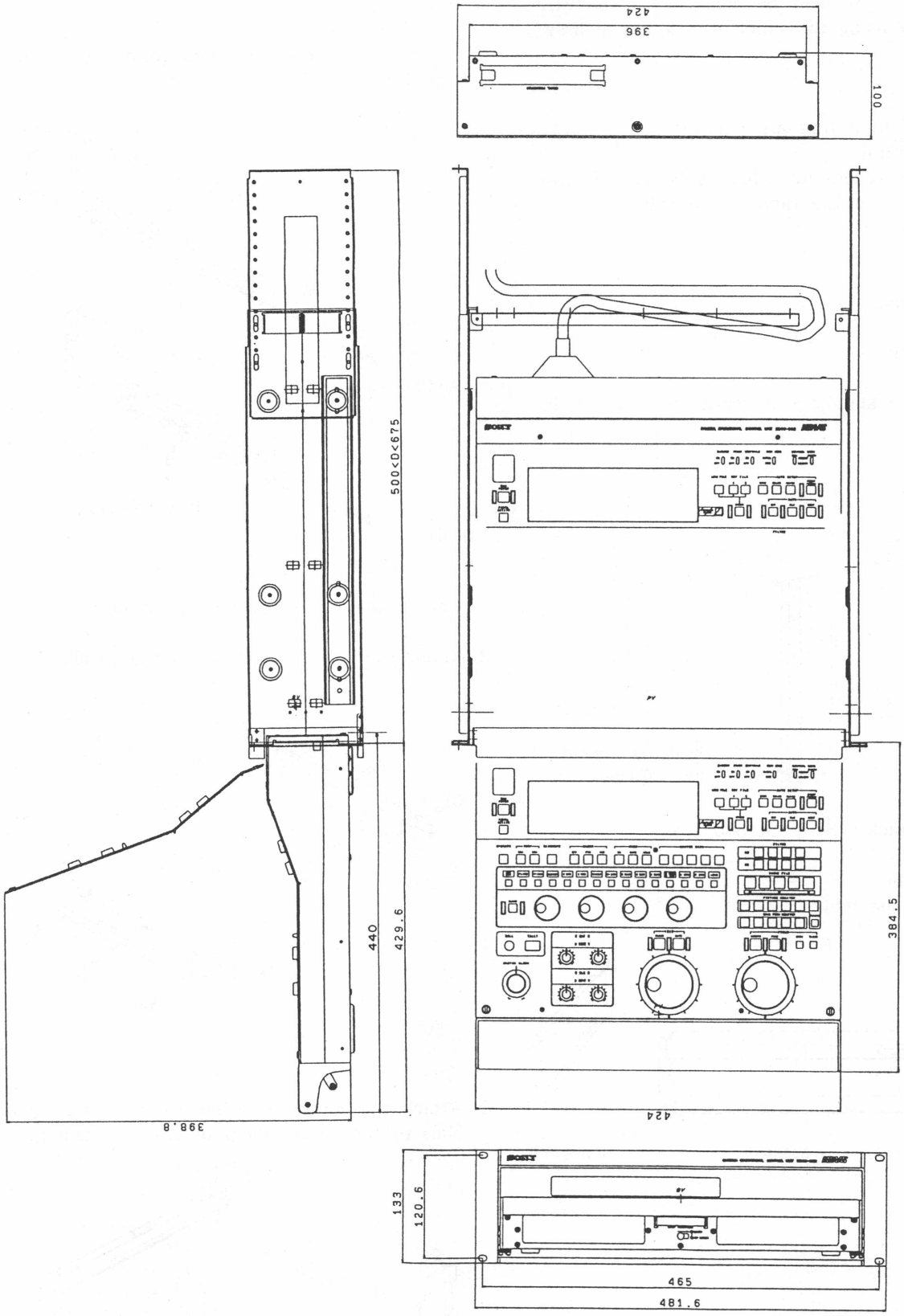
HDC-300



HDCS-300


221.1
424
465
482
146
221.3
435.5
445.5
429.5
123.8
212.7
254
68.9
323.8
450

HDCO-300



1-6-3. Installation of HDCS-300 and HDCO-300

HDCS-300/HDCO-300 can be installed on the EIA 19-inch rack by using the supplied rack mount assy.

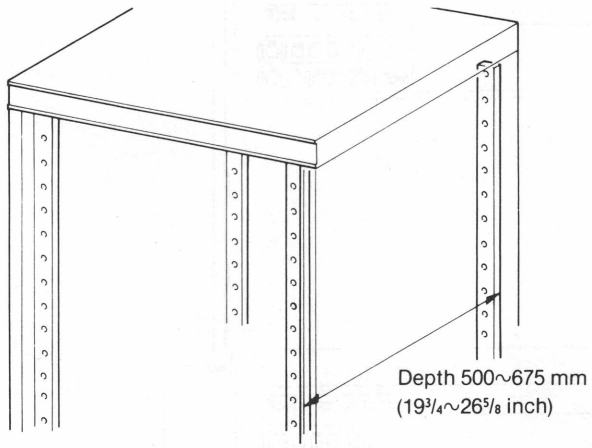
Mounting

Three types of mounting are possible.
- 19" rack mount
  The panel is taken out when it is used. It can be removed from the rack temporarily.
- Table mount
- Desktop use

19" Rack Mount

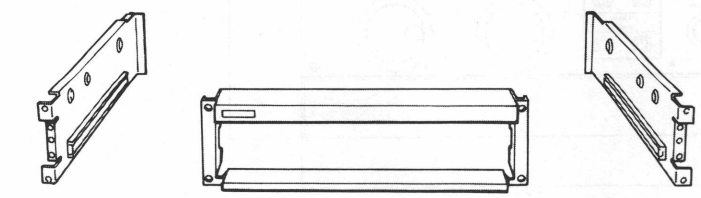
- Standard rack

  19" rack (EIA standard, universal spanning — M5 type)



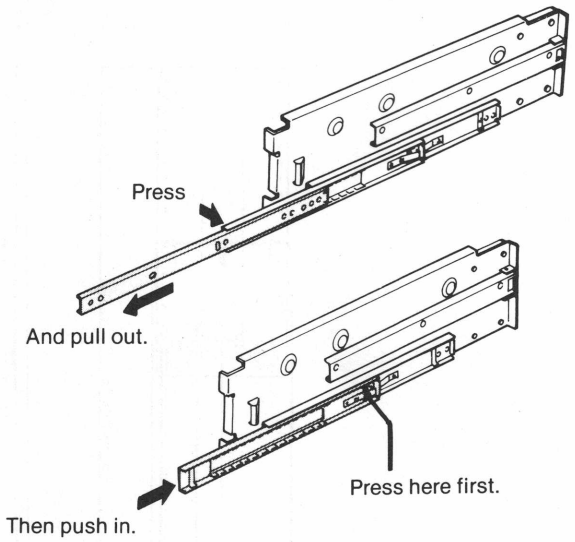
Recommended rack : Sony SU-860 series

- Supplied parts
  Rack mount assembly



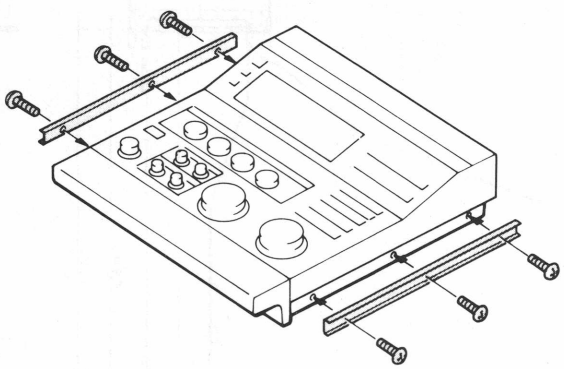
- Procedure

1. Remove the inner members from the L and R assemblies.

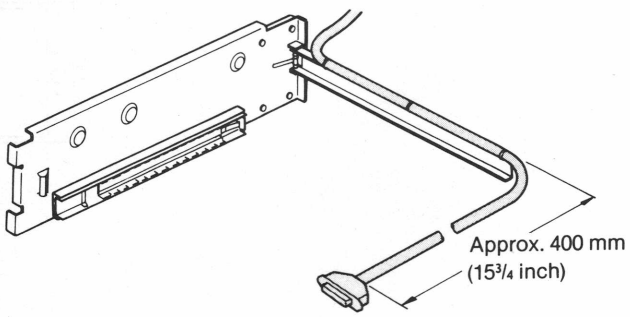


   Return the rail to original position.

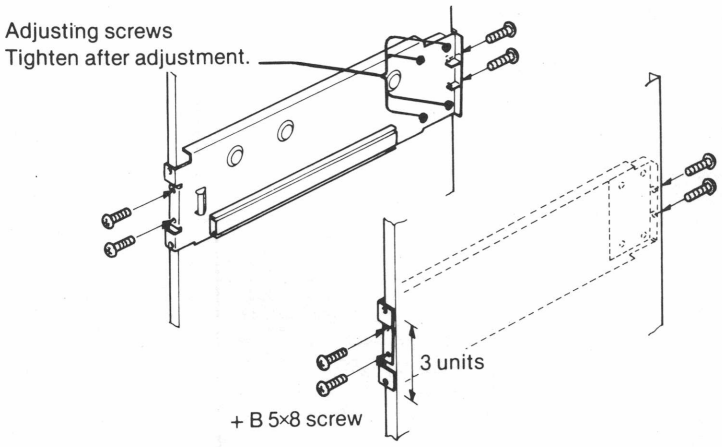
2. Mount the inner members to the panel.



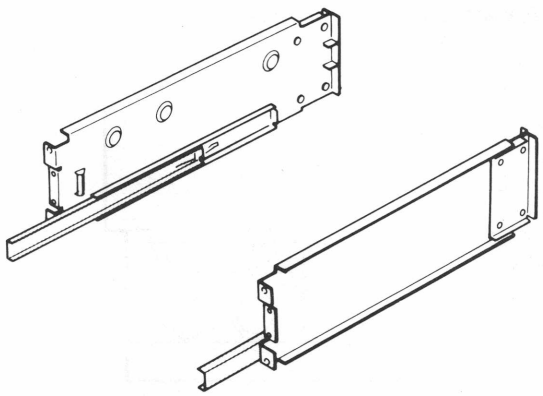
3. Attach the connector cable (supplied with HDCS-300) to the cable clamp of the L assembly.



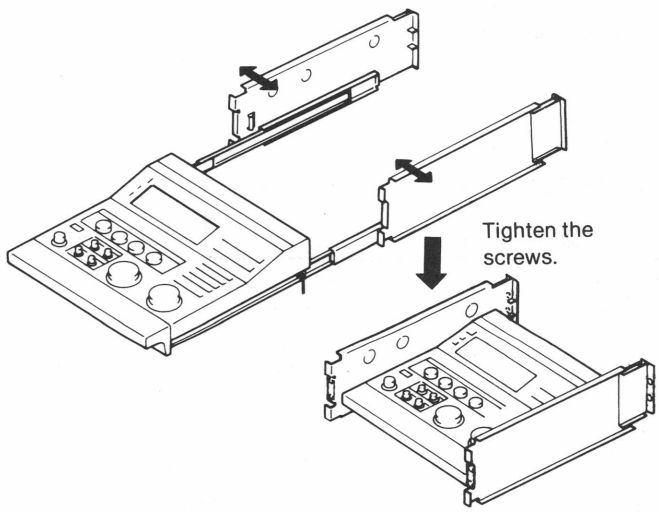
4. Fix both L and R assemblies temporarily.



5. Pull the rail out all the way.

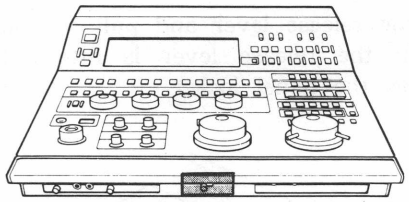


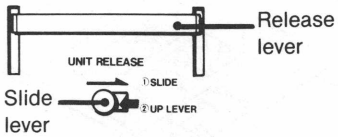
6. Mount the panel unit temporarily



Be sure that the stopper is not protruding. (See "Removing the panel from the rack" on page 1-26.) Move both L and R assemblies to right and left using the panel as a guide.

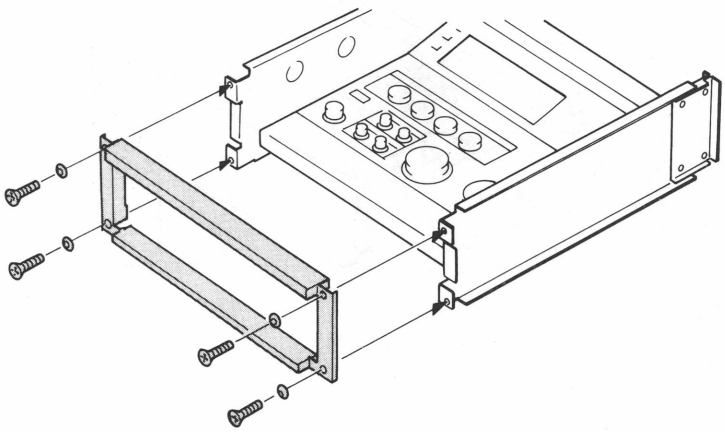
7. Move the slide lever to the left.





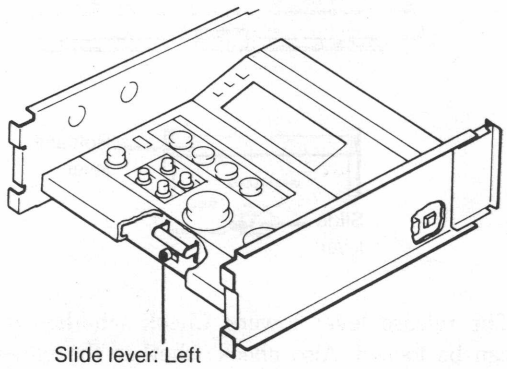
The release lever lowers. Check whether the panel can be locked. Also check whether the panel moves forward and backward smoothly using the handle. (See "Removing the panel from the rack.") If the panel does not move smoothly, undo the screws and re-adjust the L and R assembly positions.

8. Mount the F assembly using the + RK and trapezoidal shaped decorative washers, and fix to the L and R assemblies.

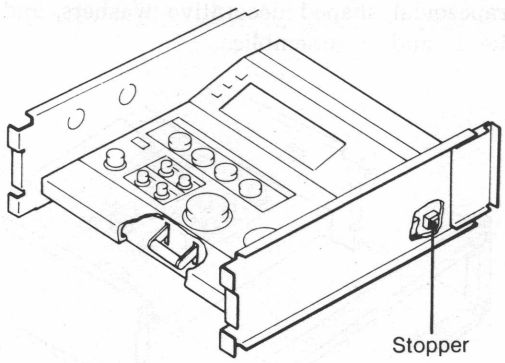


- Removing the panel from the rack

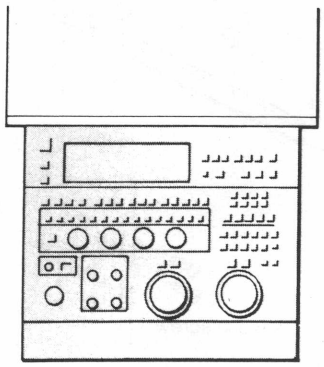
Lift the release lever and pull the panel. (When the release lever is lifted, the stopper releases the panel lock.)



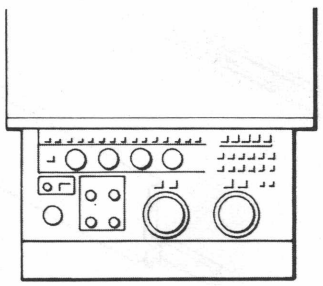
With the release lever lowered, the stopper protrudes when the panel reaches one of the specified three positions and the panel is locked.



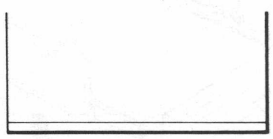
To operate entirely



To operate only the front part



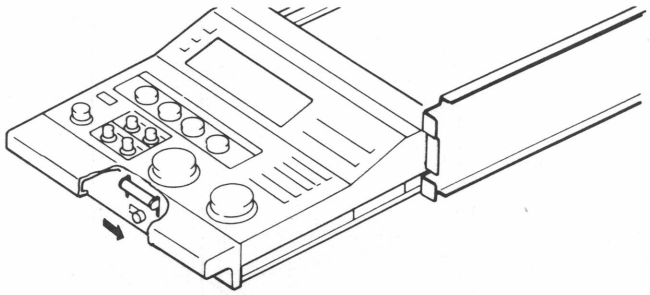
To put in the mounting rack



• Temporary removal

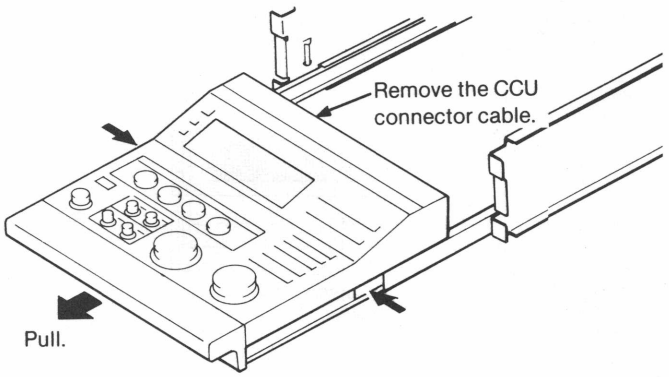
1. Pull out the panel fully.

2. Move the slide lever to the right while lifting the release lever.
When the slide lever is released, the release lever stays up and the stopper remains withdrawn.

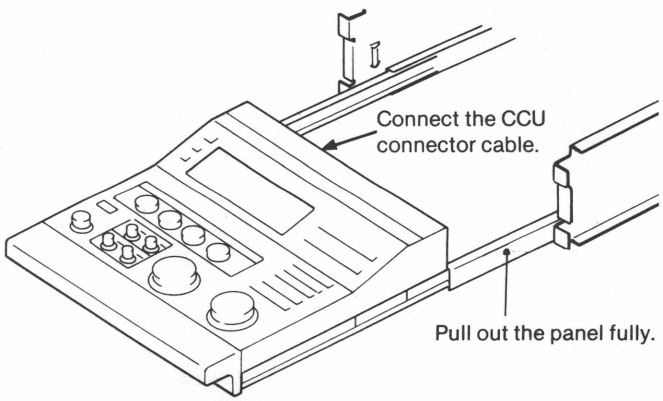


3. Pull the panel out further.

4.



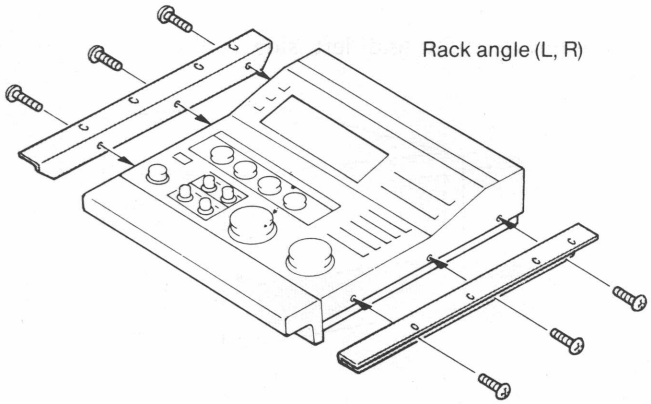
• Re-mounting



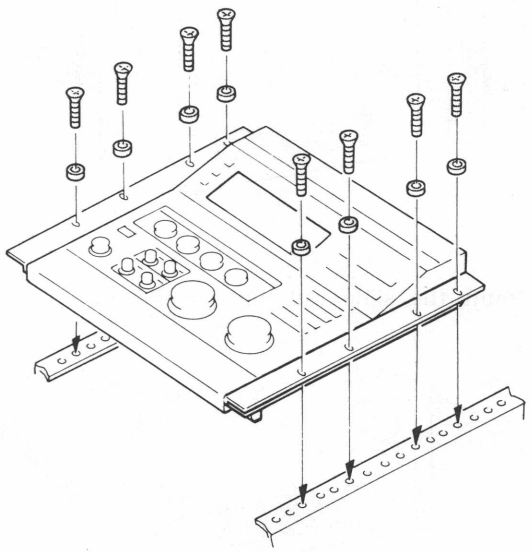
Push the panel following the rail guide.

Table mount

1.



2. Fix it on the table.

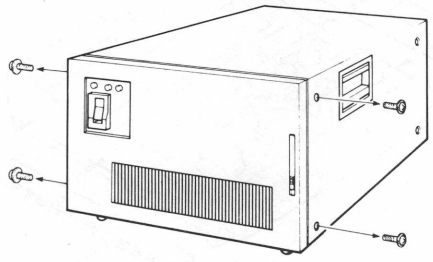


Trapezoidal shaped decorative washers

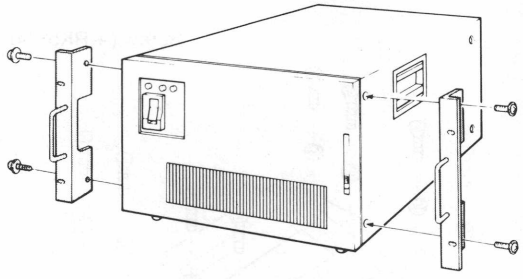
Rack Mount

This unit may be mounted on a 19"EIA standard rack.

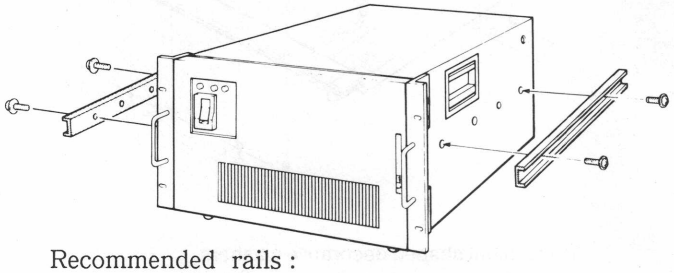
1. Remove right and left side screws.



2. Mount the rack angles using the screws removed in step 1.

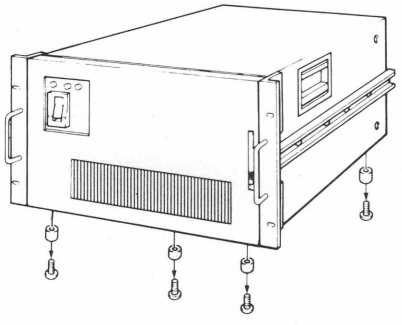


3. Mount the slide rail inner members.



Recommended rails :
Model 305 14, 15, 18 inch
Model 203 16, 22 inch

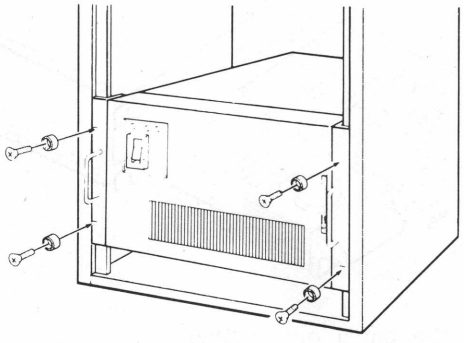
4. Remove the legs.



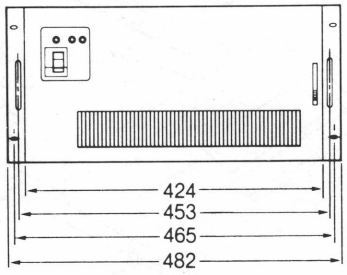
Attach the removed screws again.

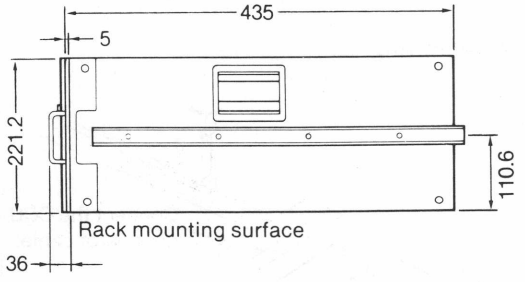
5. Mount the brackets and the slide rail outer members to the rack.

6. Secure with screws.



- Dimensions after mounting





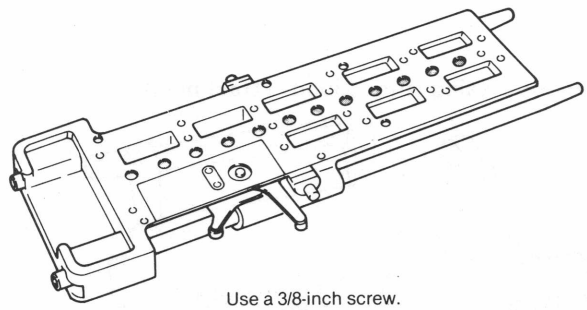
Unit: mm

1-6-4. Assembly of HDC-300

Using a Portable Lens

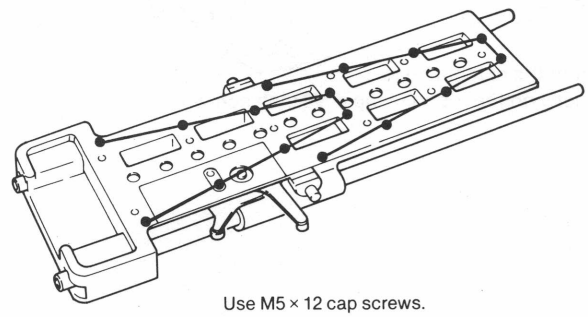
1. Mount the V-wedge on the tripod attachment.

Vinter type



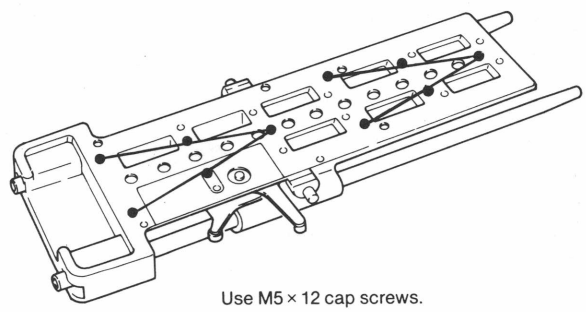
Use a 3/8-inch screw.

Shotoku type (TE-02/06)



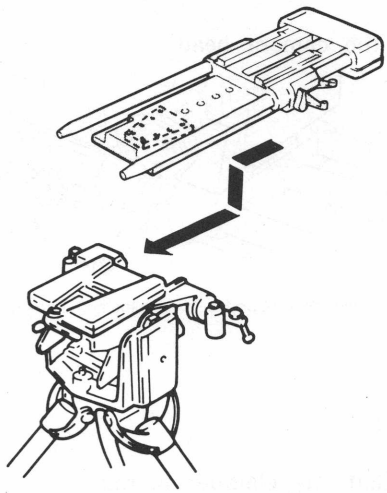
Use M5 × 12 cap screws.

Shotoku type (TE-05)



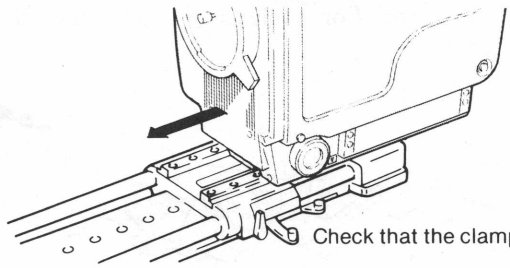
Use M5 × 12 cap screws.

2. Mount the tripod attachment on the tripod.



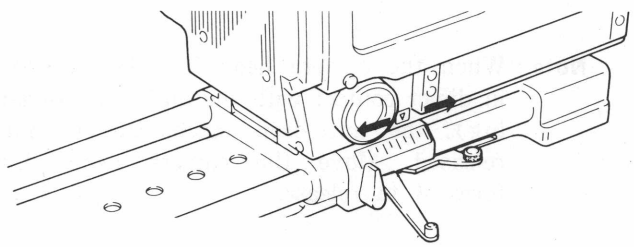
3. Mount the camera head.

① Place the front and slide.

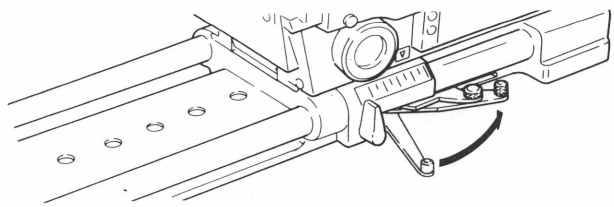


Check that the clamper is raised.

② Position the camera head after checking that the ▽ mark is aligned with the scale range or that the anti-drop mechanism has clicked for startup.



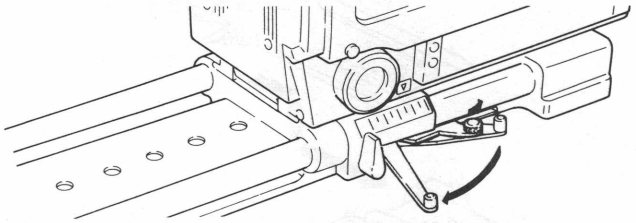
③ Lock.



4. Mount the lens.

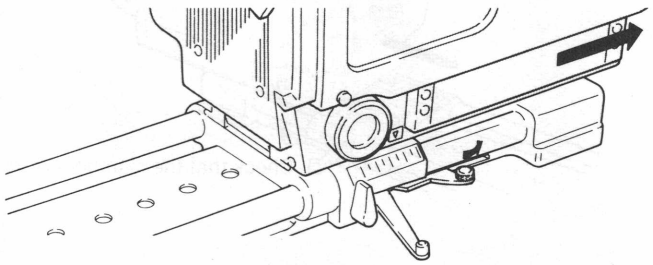
Releasing the camera head lock

Removing the camera head



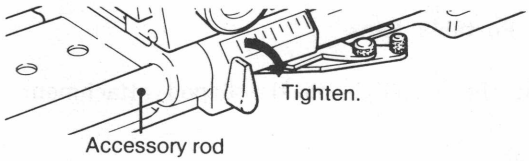
The camera head will remain seated as long as the anti-drop mechanism is still functioning.

1. Check that the clamper is raised.
2. Retract the camera head while fully depressing the red lever (or releasing the anti-drop mechanism).

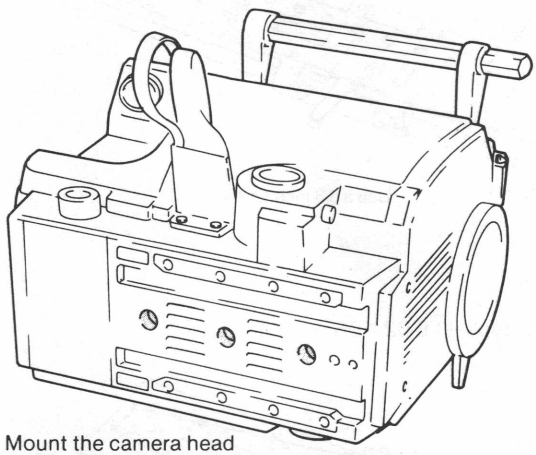


Note : When the camera head is fully recessed (or in direct contact with the anti-drop mechanism lug), the anti-drop mechanism cannot be released. Move the camera head slightly forward to release.

Tightening the accessory rod



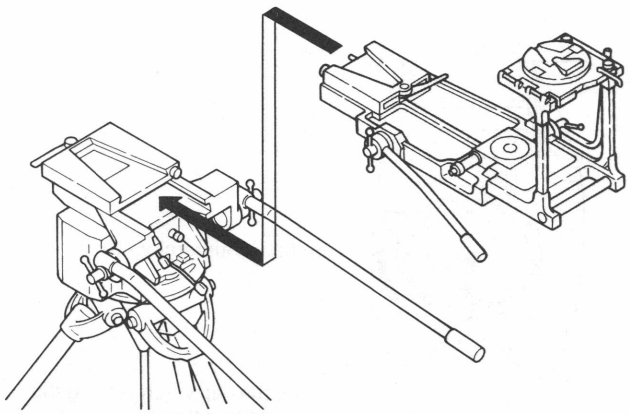
When not using the tripod attachment



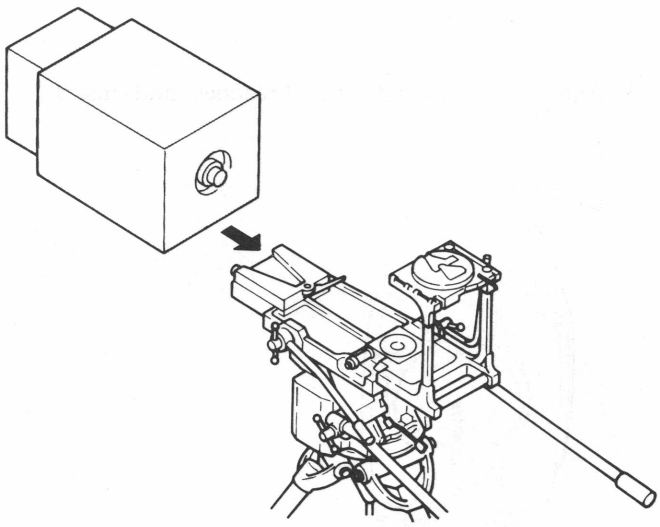
Mount the camera head directly on the tripod using a 3/8-inch screw.

Using a Large Lens

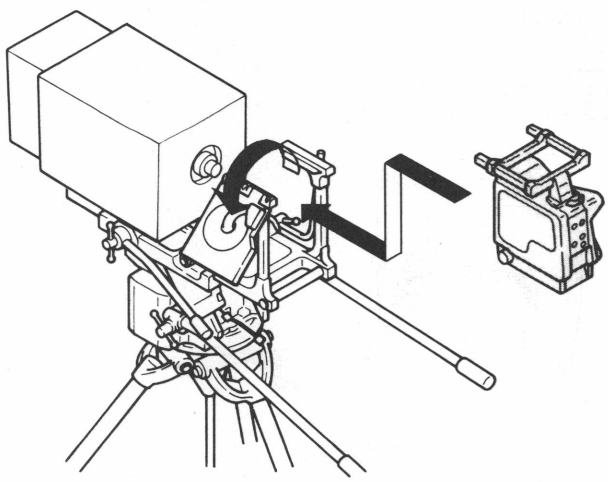
1. Mount the lens support on the tripod.



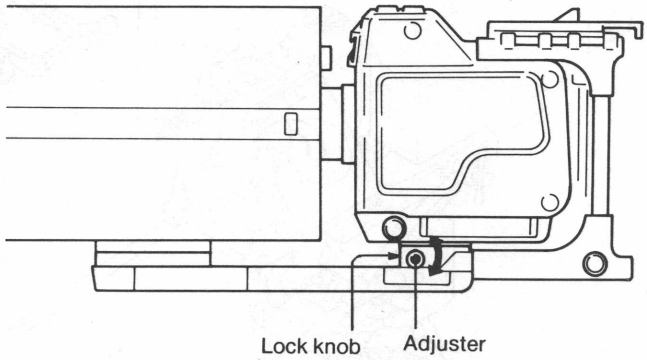
2. Mount the lens on the lens support.



3. Open the top plate of the lens support and place the camera head on the lens support.

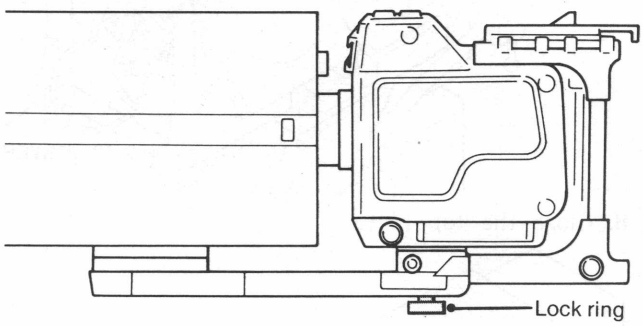


4. Mount the camera head on the lens while adjusting the height.



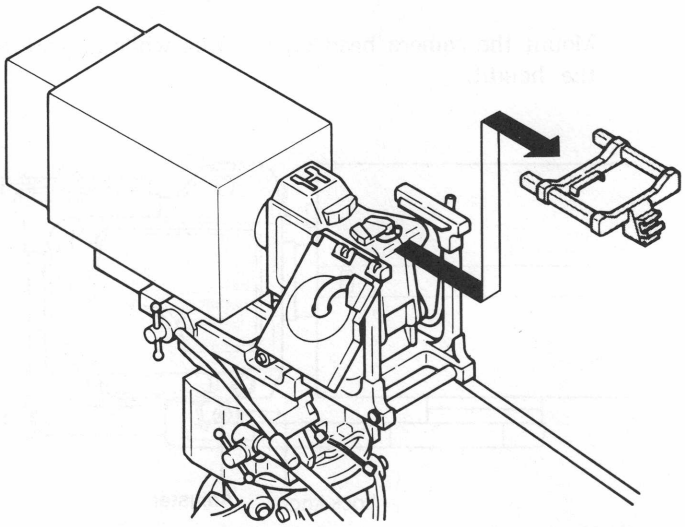
The procedure may differ depending on the lens used. Refer to the operation manual of your lens.

5. Attach the lens support screw to the camera head bottom and tighten it to secure the camera head.

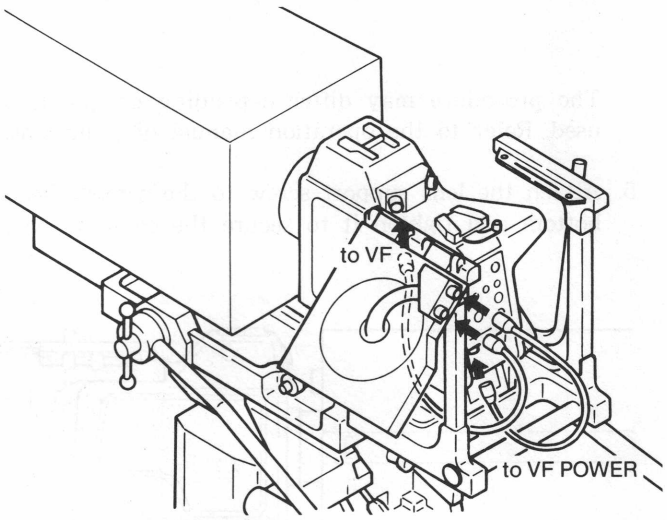


The procedure may differ depending on the lens used. Refer to the operation manual of your lens.

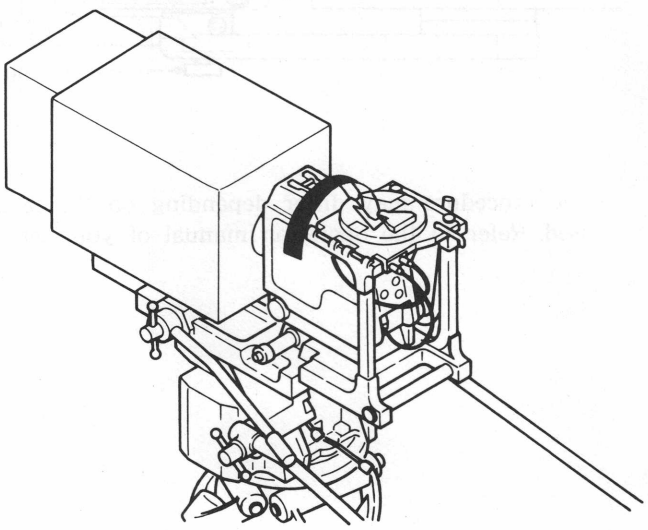
6. Remove the camera head carry handle.



7. Connect the HDVF-75 7-inch viewfinder cables.



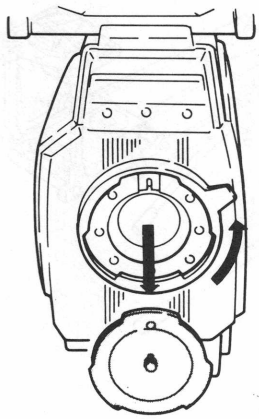
8. Close the top plate.



For details on installation of the HDVF-75, refer to its operation and maintenance manual.

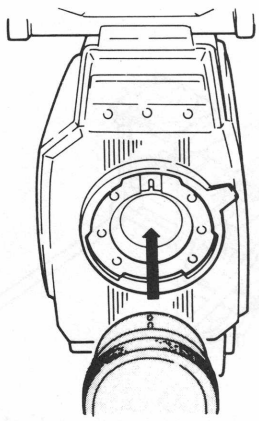
Mounting the lens

1. Remove the cap.

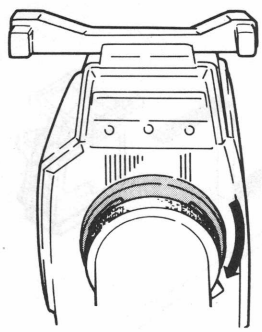


Cap
Replace the cap when leaving the camera without the lens.
The installation procedure is the same as that for the lens.

2. Align the lugs with the breaches and insert.



3. Tighten.

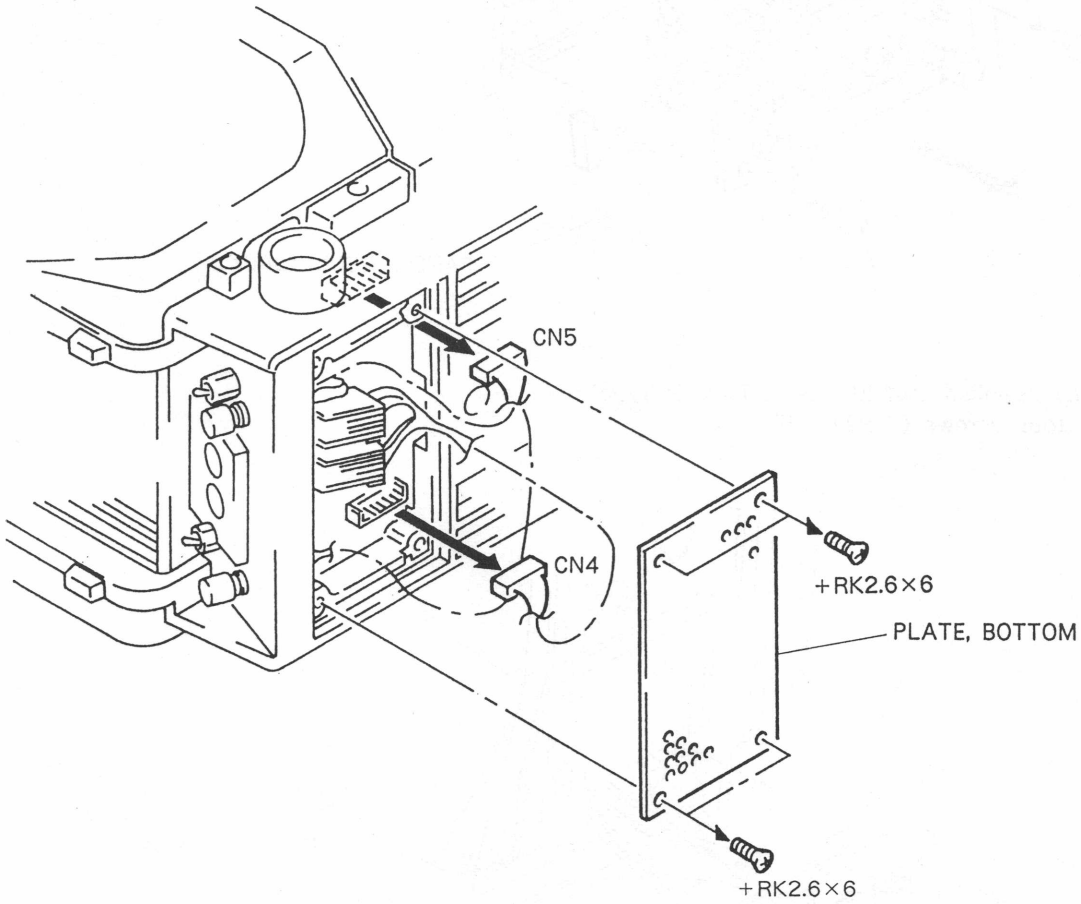


1-6-5. Replacement Procedure for XLR Type PANEL, INCOM

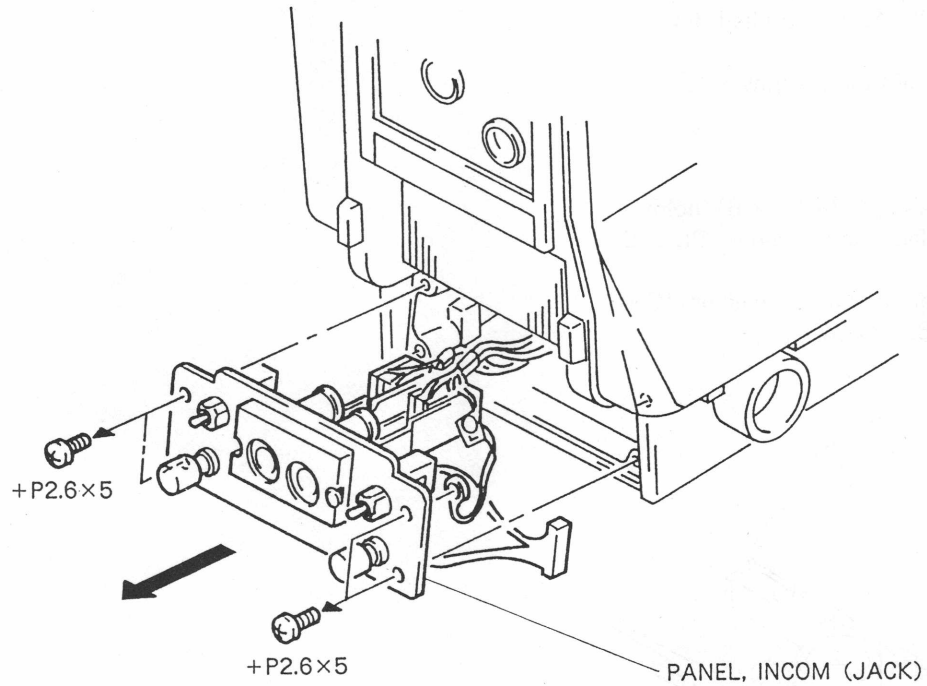
When the unit is shipped from the factory, the "Jack, Phone" are attached to PANEL, INCOM.
The XLR type PANEL, INCOM is supplied for use with the XLR type.
Replace by the procedure outlined below.

HDC-300

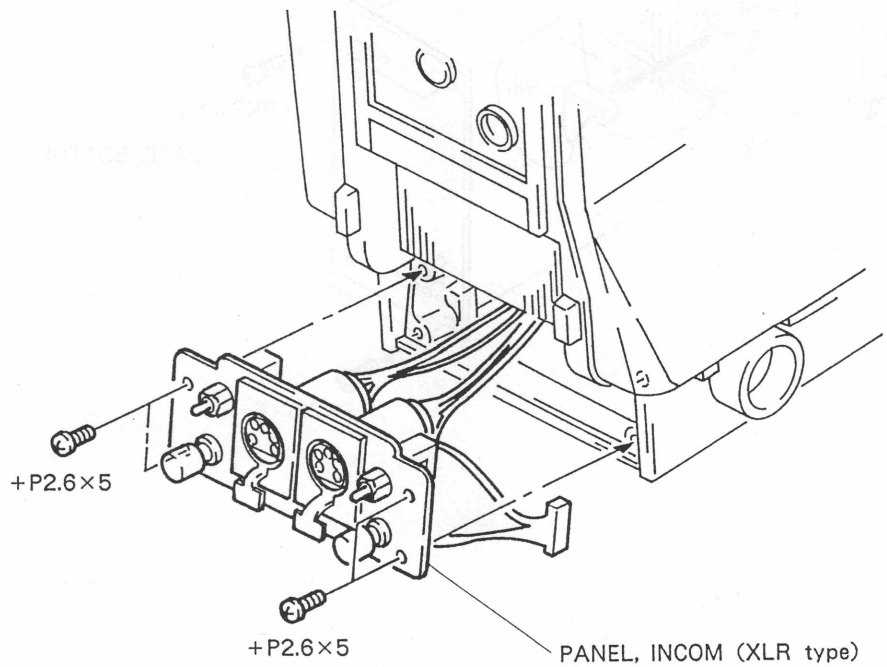
1. Remove the four screws (+ RK2.6 × 6) holding PLATE, BOTTOM in place and remove PLATE, BOTTOM.
   Also, pull off the plugs of the two connectors (CN4 and CN5) on the CN-262 board.



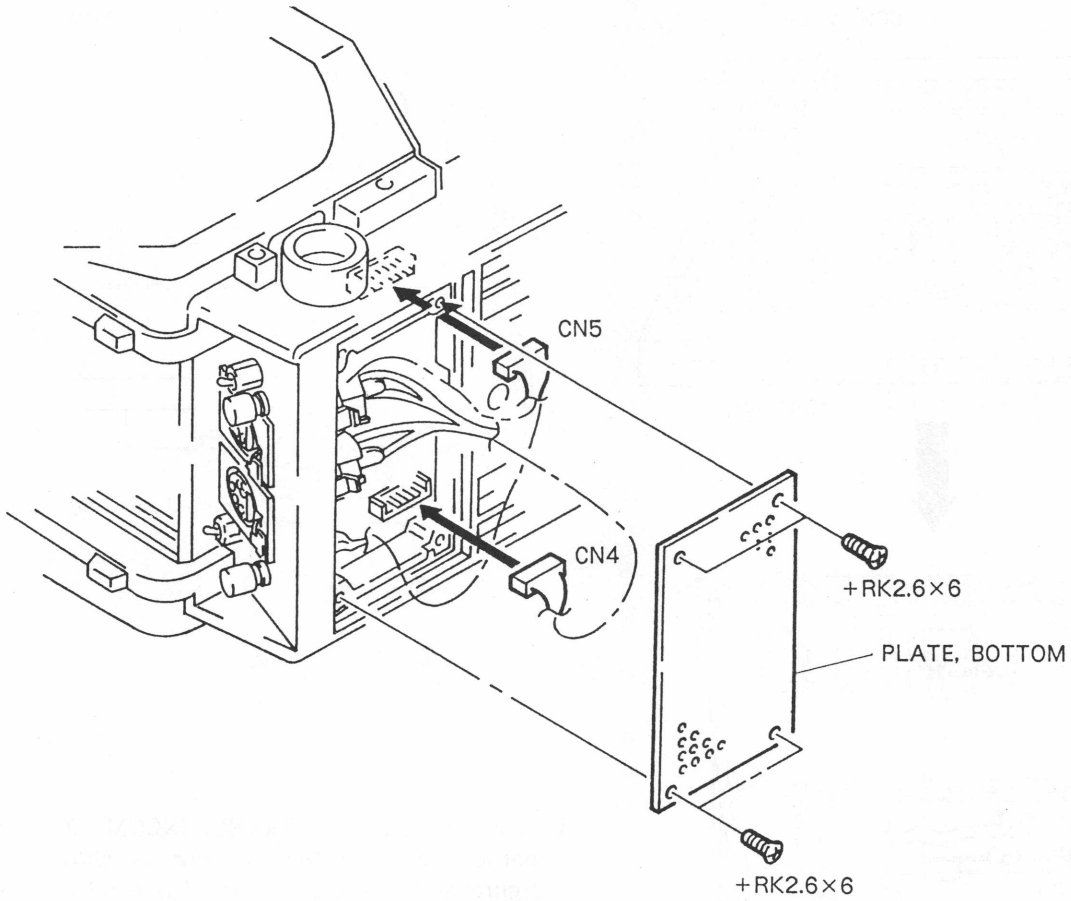
2. Remove the four screws (+ P2.6 × 5) holding PANEL, INCOM (JACK) and pull out it in the direction of arrow.



3. Attach the supplied PANEL, INCOM (XLR type) with the four screws (+ P2.6 × 5).

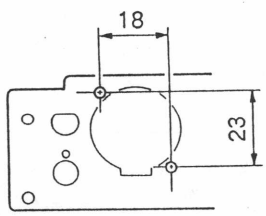


4. Connect the harness of PANEL, INCOM (XLR type) to connectors CN4 and CN5 on the CN-262 board, and attach PLATE, BOTTOM with the four screws (+ RK2.6 × 6).

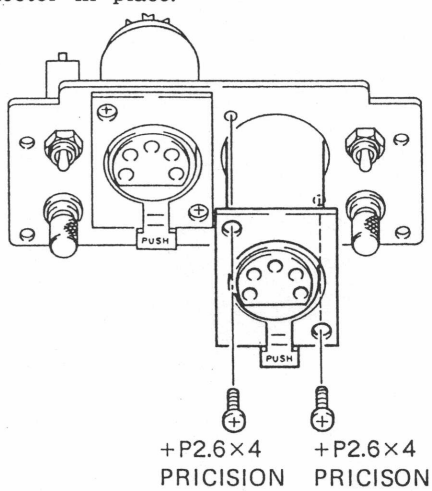


Use of XLR Type Not Having 5 Pins

[Attachment Dimensions for Applicable Connector]

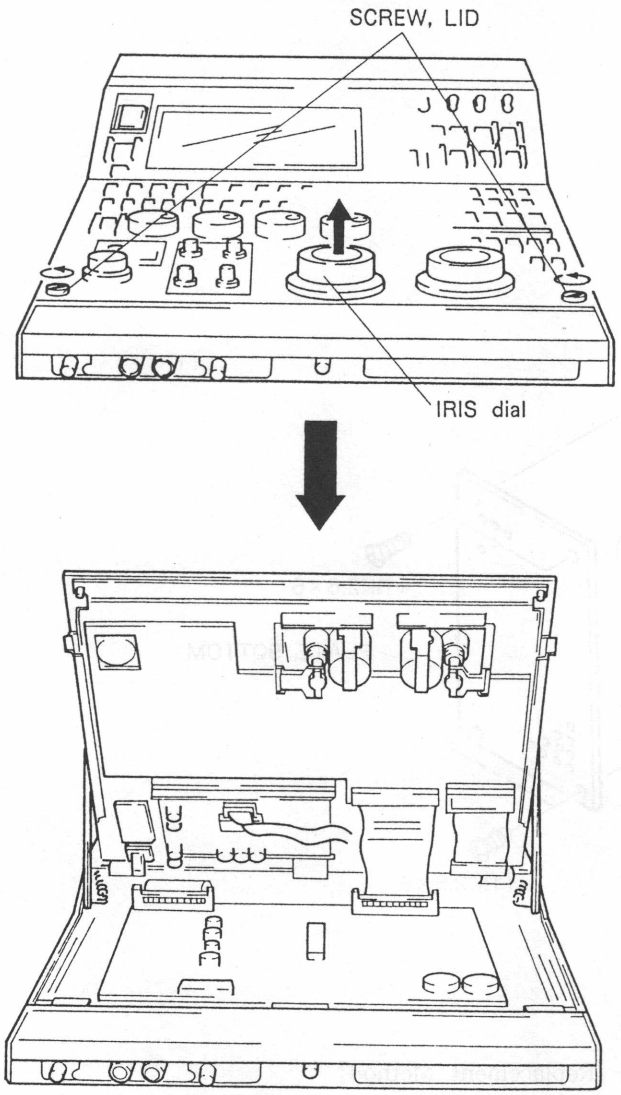


[Replacement Method]
Remove the four screws (+ P2.6 × 4) holding the XLR type connector in place.

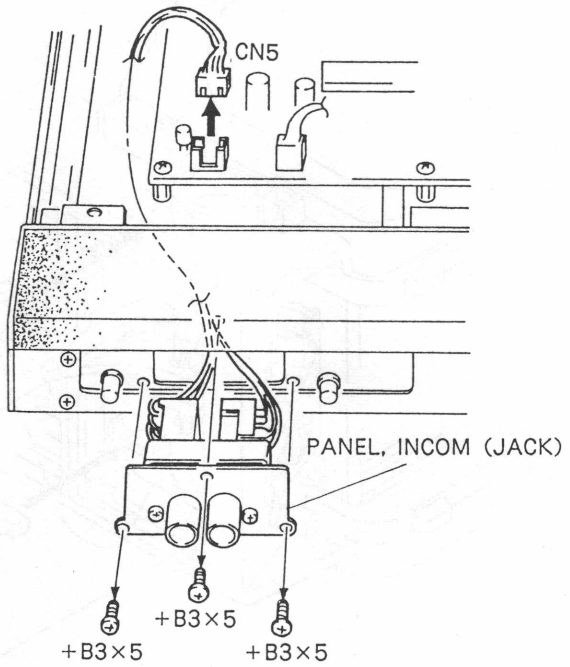


HDCO-300

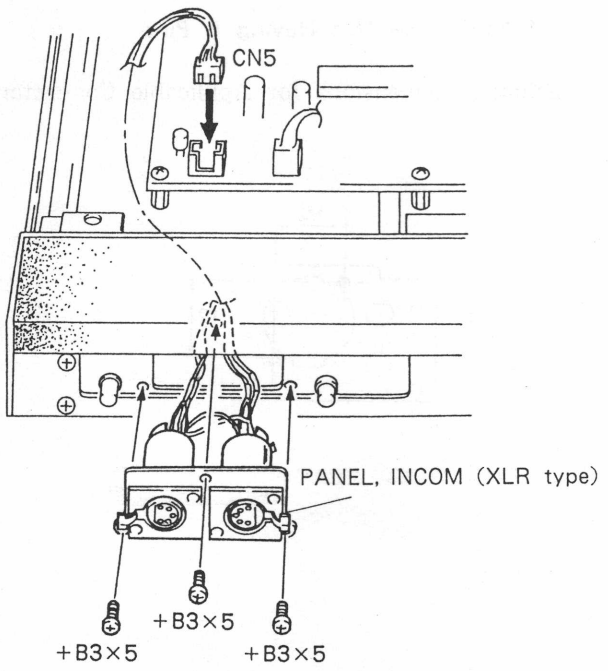
1. Loosen the two screws (SCREW, LID), grasp the IRIS dial and pull up until the upper panel locks.



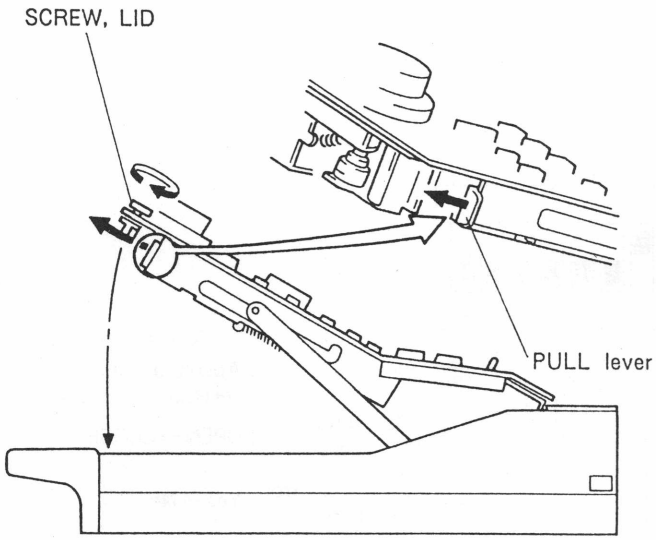
2. Remove the plug of the CN5 connector on the CP-130 board. Remove the three screws (+ B3 × 5) holding PANEL, INCOM (JACK) in place, and pull PANEL, INCOM out towards you.



3. Pass the supplied PANEL, INCOM (XLR type) harness through the opening as shown in the figure and connect to the CN5 connector of the CP-130 board. And attach PANEL, INCOM (XLR type) in place with the three screws (+ B3 × 5).

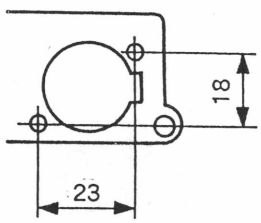


4. While pulling the PULL levers on the left and right (lock release), close the panel. (To prevent sandwiching of your hand, change your grip to the IRIS dial while closing.)
   Then tighten the two screws (SCREW, LID)

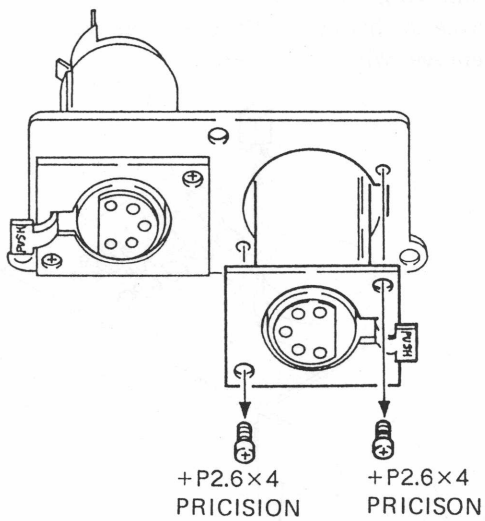


Use of XLR Type Not Having 5 Pins

[Attachment Dimensions for Applicable Connector]



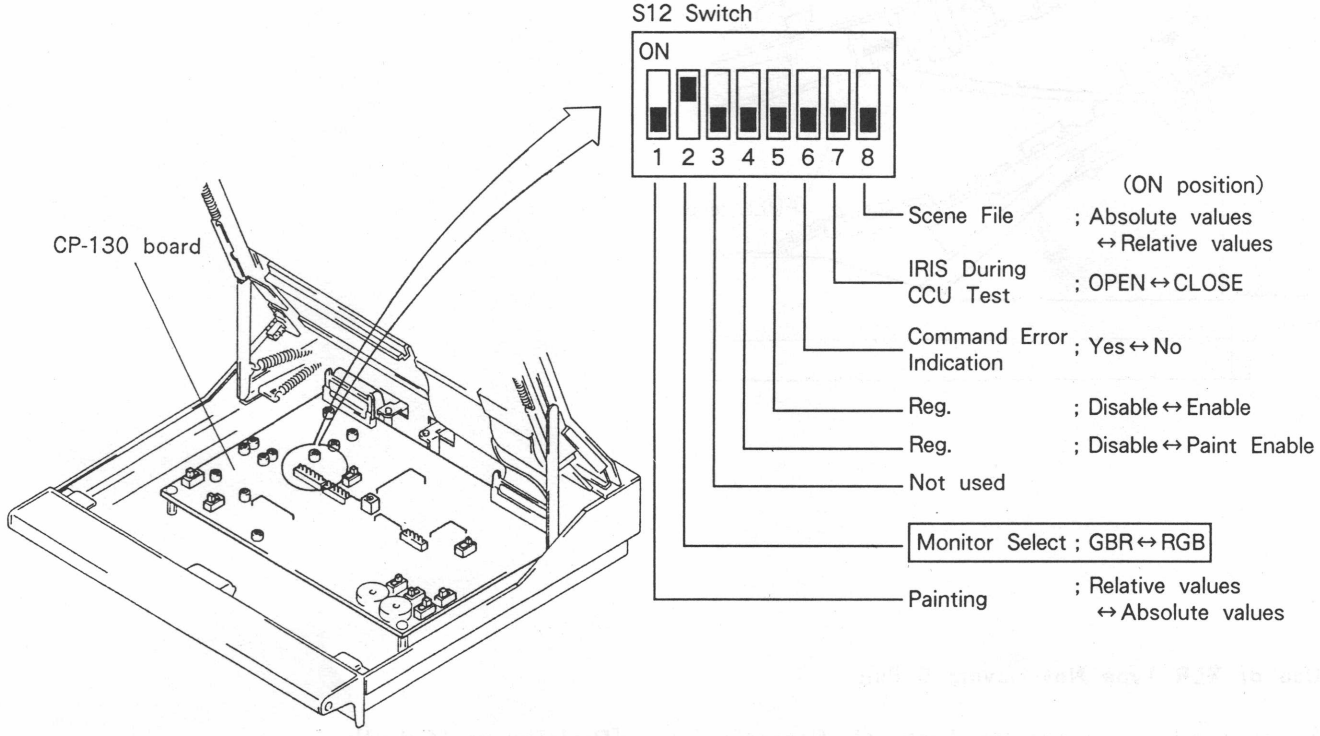
[Replacement Method]
Remove the four screws (+P2.6 × 4) holding the XLR type connector in place.



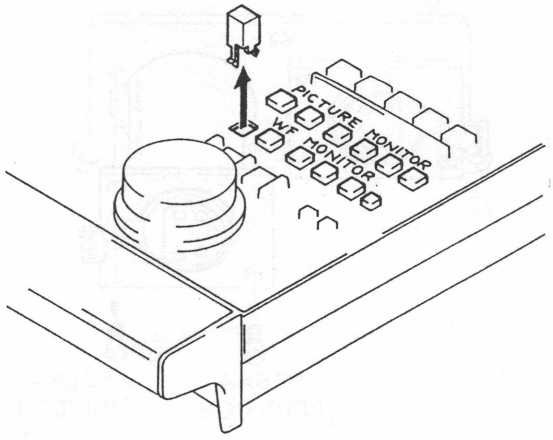
Changing Order of PICTURE MONITOR / WFM MONITOR Selectors to RGB [HDCO-300]

The order is GBR when the unit is shipped from the factory.
Follow the procedure below for changing this order to RGB.

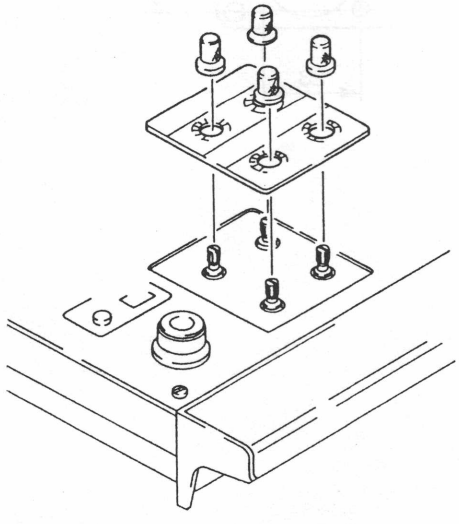
1. Set the S12-2 (RGB/GBR) switch on the CP-130 board to the ON position.


S12 Switch
ON
1 2 3 4 5 6 7 8
CP-130 board
(ON position)
Scene File ; Absolute values ↔ Relative values
IRIS During CCU Test ; OPEN ↔ CLOSE
Command Error Indication ; Yes ↔ No
Reg. ; Disable ↔ Enable
Reg. ; Disable ↔ Paint Enable
Not used
Monitor Select ; GBR ↔ RGB
Painting ; Relative values ↔ Absolute values

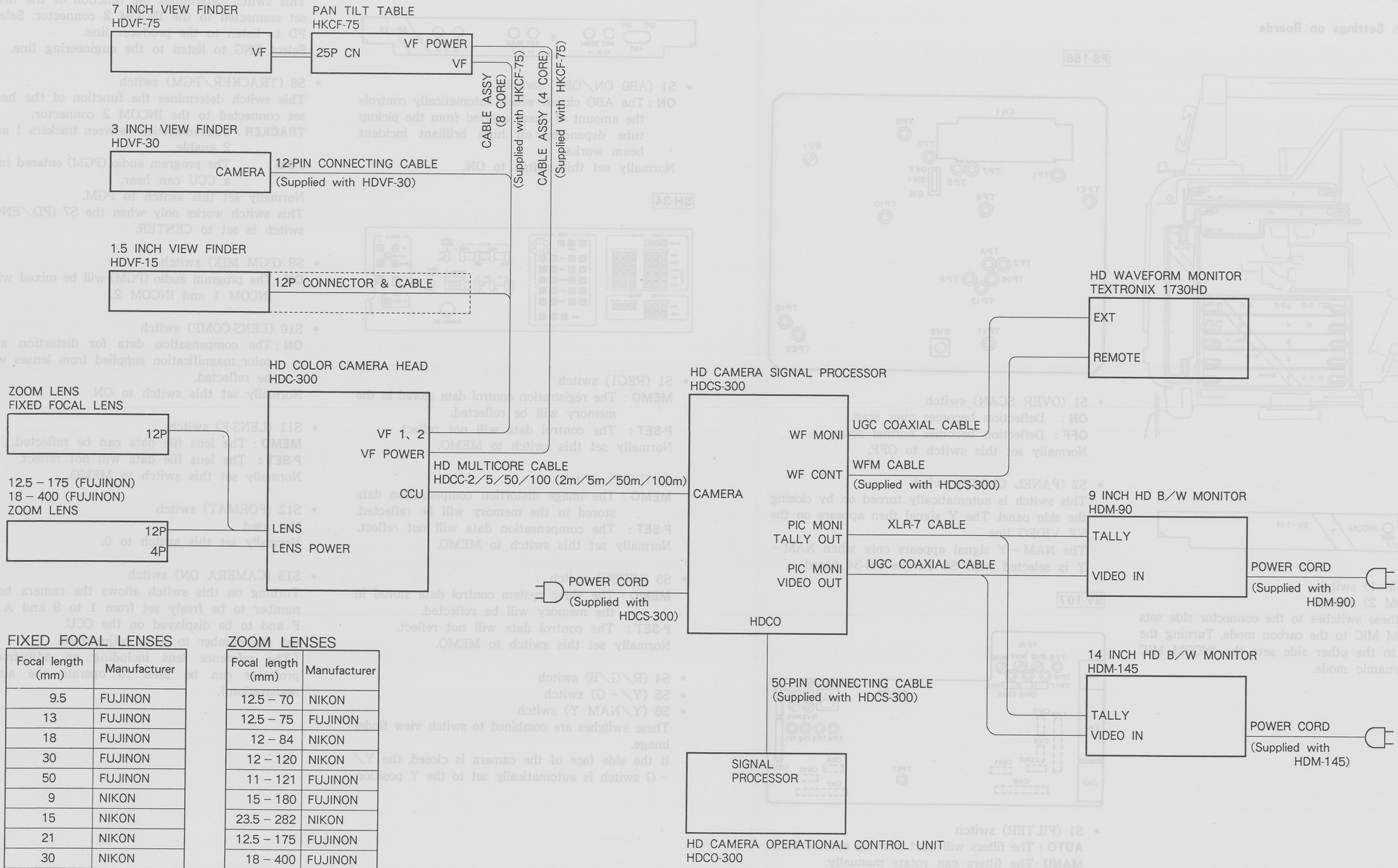
2. Change the [G], [B], [R] key tops of the PICTURE MONITOR selectors and WFM MONITOR selectors.
   - Removing key tops
     Place a heavy cloth over the key tops and remove with the pliers.



3. Remove the four PAINT knobs and remove the seat attached to the top of the PAINT knobs. Attach the RGB seat (supplied).



1-7. CONNECTION EXAMPLE



FIXED FOCAL LENSES

Focal length (mm)	Manufacturer
9.5	FUJINON
13	FUJINON
18	FUJINON
30	FUJINON
50	FUJINON
9	NIKON
15	NIKON
21	NIKON
30	NIKON
50	NIKON

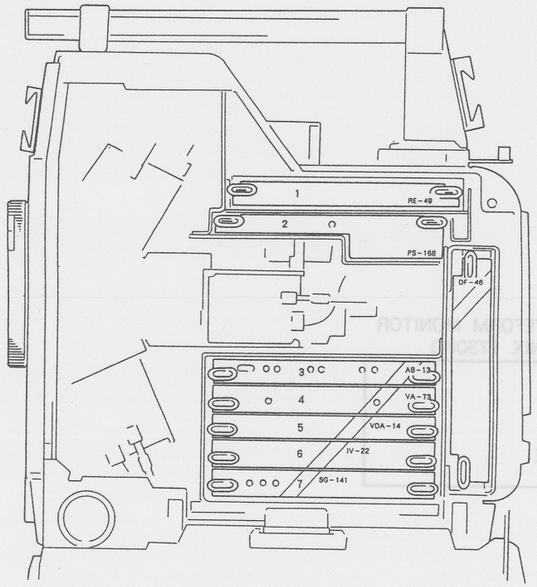
ZOOM LENSES

Focal length (mm)	Manufacturer
12.5 – 70	NIKON
12.5 – 75	FUJINON
12 – 84	NIKON
12 – 120	NIKON
11 – 121	FUJINON
15 – 180	FUJINON
23.5 – 282	NIKON
12.5 – 175	FUJINON
18 – 400	FUJINON

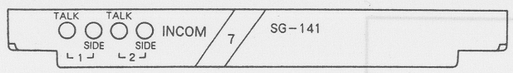
1-8. INITIAL SETTING BEFORE OPERATION

1-8-1. Switch Settings on Boards

HDC-300



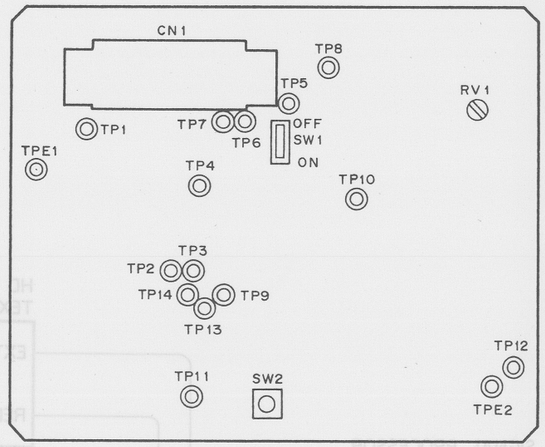
SG-141



- S1 (INCOM 1) switch
- S2 (INCOM 2) switch

Turning these switches to the connector side sets the INCOM MIC to the carbon mode. Turning the switches to the other side sets the INCOM MIC in the dynamic mode.

PS-168



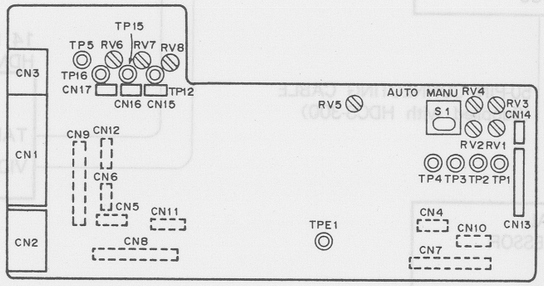
- S1 (OVER SCAN) switch

ON : Deflection becomes over scan.
OFF : Deflection becomes normal scan.
Normally set this switch to OFF.

- S2 (PANEL CLOSE) switch

This switch is automatically turned on by closing the side panel. The Y signal then appears on the VF VIDEO line.
The NAM – Y signal appears only when NAM – Y is selected with S6 on the SH-34 board.

SV-107



- S1 (FILTER) switch

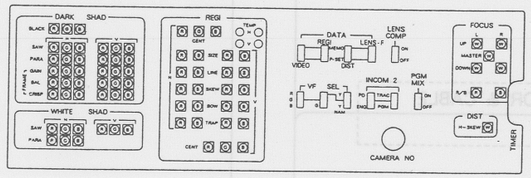
AUTO : The filters will start rotating automatically.
MANU : The filters can rotate manually.
Normally set this switch to AUTO.

AB-13

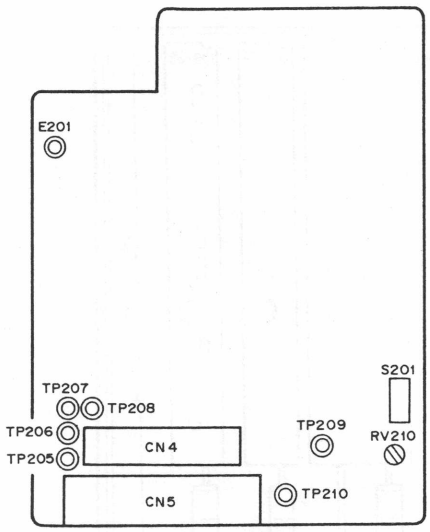
- S1 (ABO ON/OFF) switch

ON : The ABO circuit which automatically controls the amount of beam emitted from the pickup tube depending on high brilliant incident beam works.
Normally set this switch to ON.

SH-34

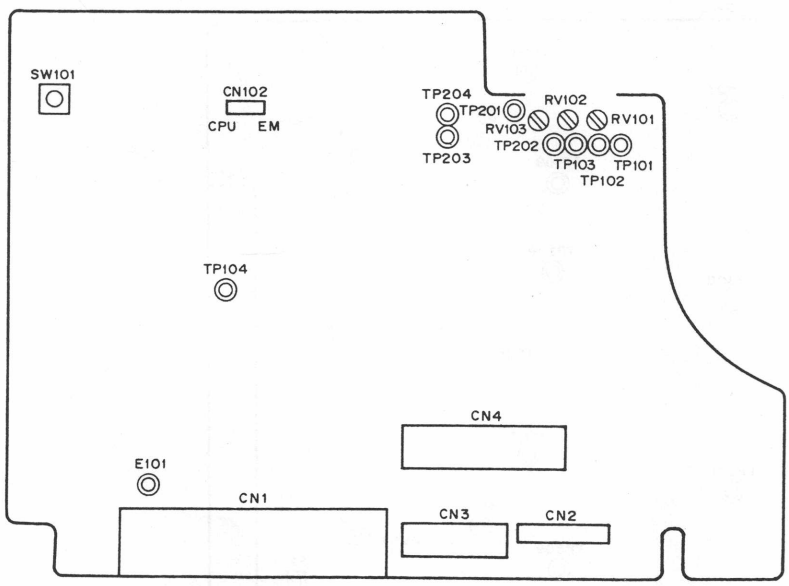

DARK
SHAD
BLACK
SAW
PARA
SAW
PARA
SAW
SAW
PARA
SAW
PARA
SAW
PARA

RG-22



- S201 (DIGITAL REG1 CORRECTION) switch
  ON : The DRC compensation will be reflected.
  Normally set this switch to ON.

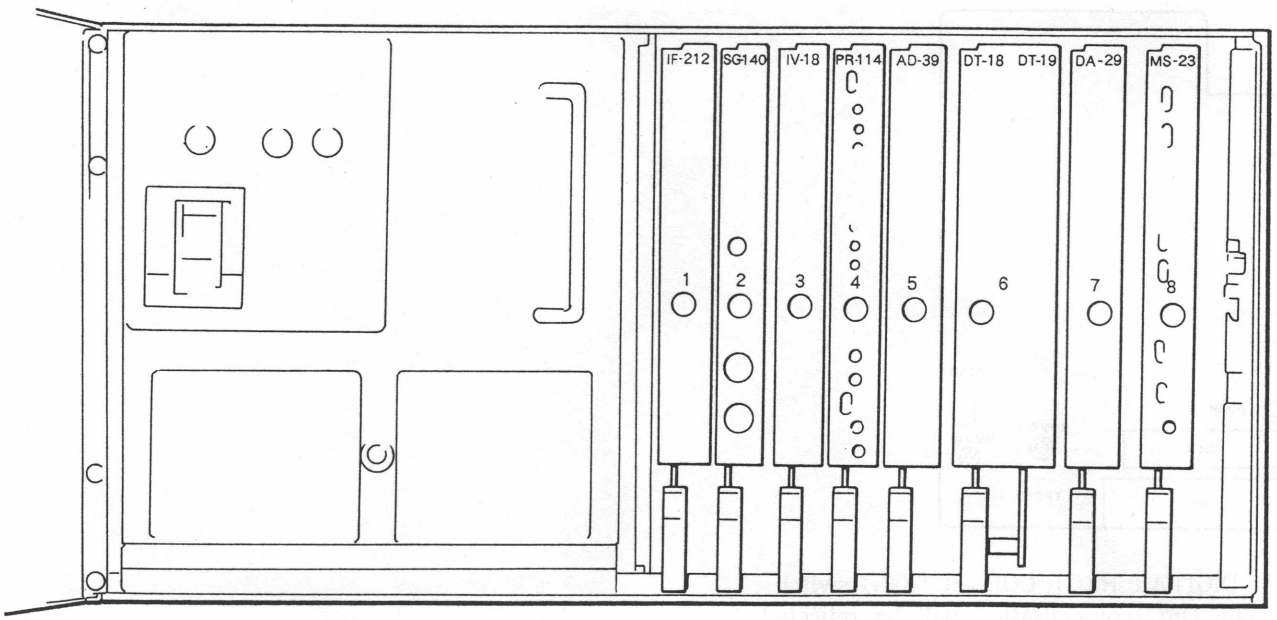
IF-213



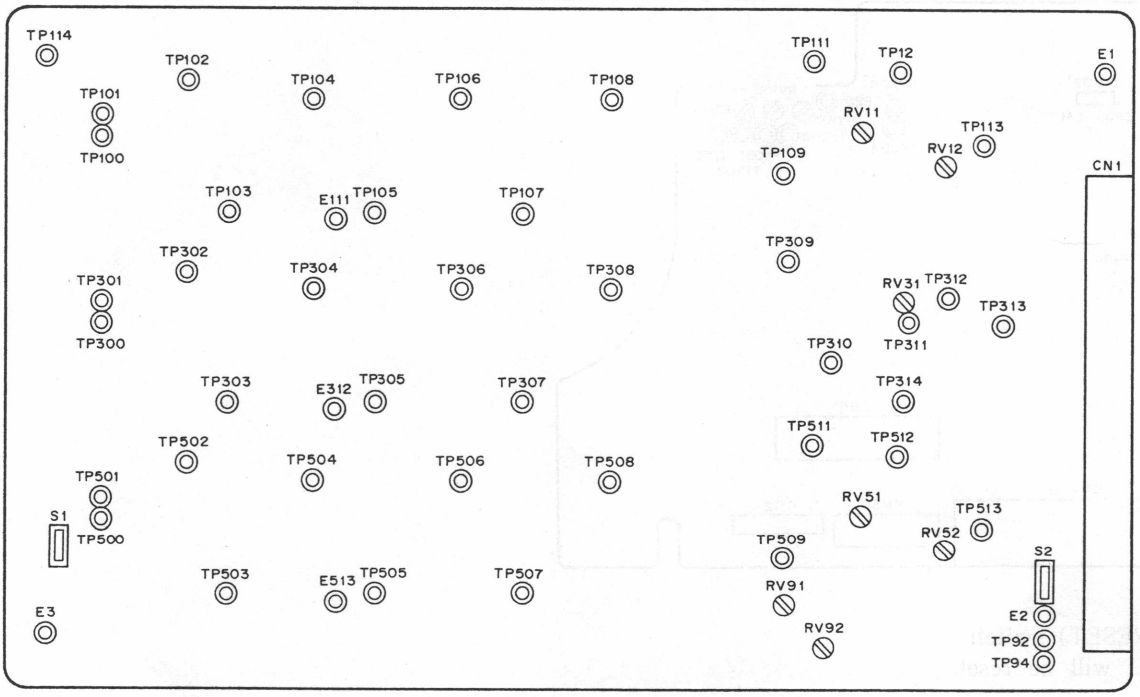
- S101 (CPU RESET) switch
  ON : The CPU will be reset.

- CN102 (EMULATION) switch
  CPU : The CPU on the IF-213 board will be operated.
  EM : The emulator can be connected.
  Normally set this switch to CPU.

HDCS-300



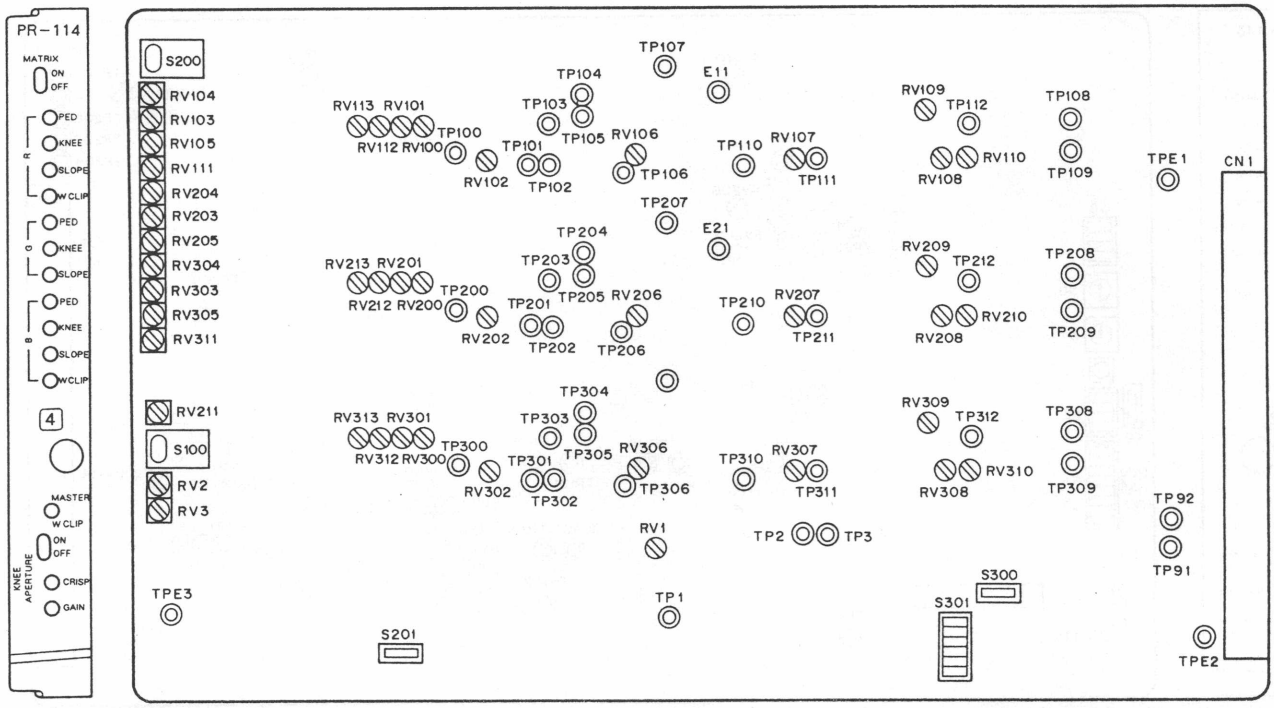
IV-18



- S1 (IOM COMP) switch
  ON : Enables 10 meters cable compensation. This is used when a field pick-up van requires the cable to be extended by 10 meters.
  OFF : Disables cable compensation.
  Normally set this switch to OFF.

- S2 (TEST) switch
  Turn on this switch when the camera is inadvertently adjusted only with the CCU without the camera head connected.
  Normally set this switch to OFF.

PR-114



- S100 (KNEE APERTURE) switch
  Turning on this switch causes the edge components on the upper part of the knee point to be emphasized.
  Turn off this switch for normal contour compensation.
  Normally set this switch to ON.

- S200 (MATRIX) switch
  Turn on this switch to operate the masking compensation.
  Normally set this switch to OFF.

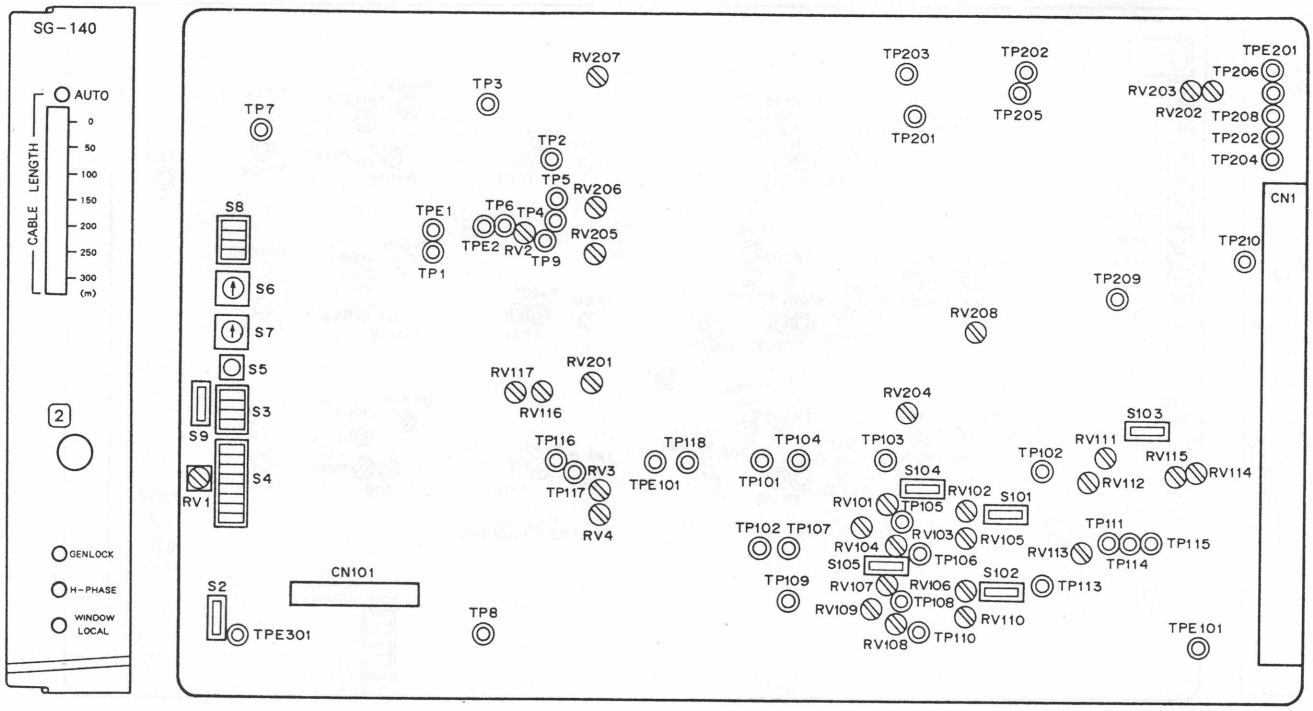
- S201 (MATRIX 1/MATRIX 2) switch
  The SMPTE linear matrix is set in MATRIX 1.
  The SMPTE-C linear matrix is set in MATRIX 2.
  Normally set this switch to MATRIX 2.

- S202 (MATRIX) switch
  ON : The linear matrix works.
  This switch is set to OFF at shipment from the factory.

- S300 (REMOTE/LOCAL) switch
  REMOTE : Control of the PR-114 board is carried out by the control panel.
  LOCAL : Control of the PR-114 board is carried out by S301.
  Normally set this switch to REMOTE.

- S301 (MATRIX/KNEE/W-CLIP/GAMMA) switch
  This switch is used to check the PR-114 board.
  ON : The MATRIX, KNEE, W-CLIP, and GAMMA circuit works.
  This switch is operates when SF301 is set to LOCAL.
  Normally set this switch to ON.

SG-140



- S2 (ANALOG THROUGH) switch
  AS : Signals not subjected to digital processing are output and the auto function does not operate.
  NG : The digital enhancer and the auto function works.
  Normally set this switch to NG.

- S3 (MANUAL WINDOW) switch
- S4 (MANUAL WINDOW) switch
  These switches are used to check IC2.
  These switches can control the windows when S9 is set to LOCAL.
  Normally set this switch to ON.

3-1 (SAFE)	Select whether the safety zone is ON /OFF.
3-2 (SAFS)	The safety zone change switch, which operates even if S9 is set to REMOTE. ON : The HDTV (16 : 9) frame and safety zone is appeared. OFF : The vistervision (1.85 : 1) frame is appeared.
3-3 (MARK)	Selects whether the marker switching is AUTO (H) or MANUAL (L).
3-4 (WDPS)	Selects the window pulse position (AUTO (L) /LOCAL (H))
4-1 (FRAM)	FRAME ON/OFF
4-2 (CMKR)	CENTER MARKER ON/OFF
4-3 (WBWD)	WHITE BALANCE WINDOW ON/OFF
4-4 (VCWD)	V CENTER WINDOW ON/OFF
4-5 (HCWD)	H CENTER WINDOW ON/OFF
4-6 (ALWD)	ALL WINDOW ON/OFF
4-7 (MIXV)	MIX VIDEO ON/OFF Selects MARKER ON/OFF for VF.
4-8 (MVIV)	MIX VIDEO INVERT for B/W

- S5 (CURSOR SELECT) switch
  This switch is used to determine which of the two cursors is to be selected when the cursor position is specified manually.
  This switch operates when S9 is set to LOCAL.

- S6 (CURSOR POSITION) switch
- S7 (CURSOR POSITION) switch
  These switches can be used to set the cursor position on a window manually when S9 is set to LOCAL.
  Normally set this switch to 0.

- S8 (CABLE COMP) switch
  This switch is used for cable compensation.
  Normally set this switch to ON.

CABLE LENGTH	S8 SETTING				REMARKS
	S8-4	S8-3	S8-2	S8-1	
AUTO	×	×	×	ON	Turned on for automatic cable compensation.
50m	ON	ON	ON	OFF	Turned on to set cable length manually when 8-1 is set to OFF.
100m	OFF	ON	ON	OFF	
150m	ON	OFF	ON	OFF	

× : DON'T CARE

- S9 (WINDOW REMOTE/LOCAL) switch
  REMOTE : Various windows can be controlled on the control panel.
  LOCAL : Various windows can be controlled by S3 to S7.
  Normally set this switch to REMOTE.

- S101 (ENG RTS) switch
  This switch is used to change the engineering line.
  Turn the switch to the right to change the engineering line to RTS and to the left to change it to clear cam.
  Normally set this switch to the right.

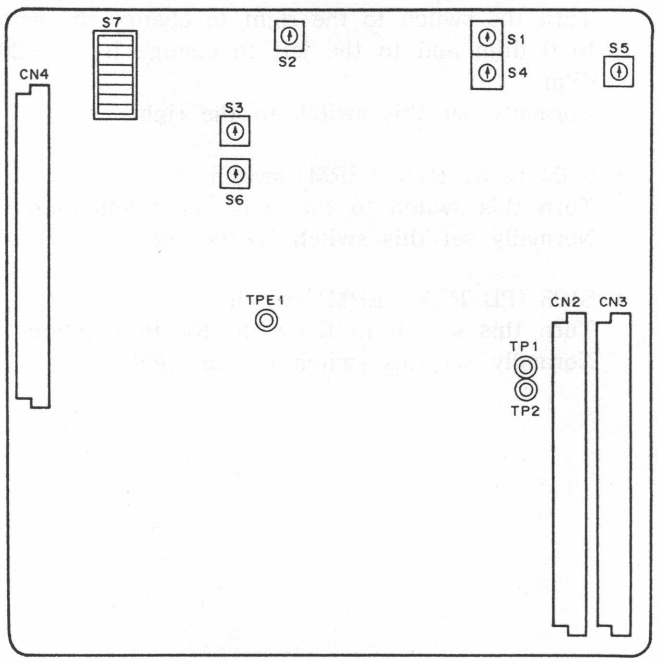
- S102 (PD RTS) switch
  This switch is used to change the producer line.
  Turn the switch to the right to change the producer line to RTS and to the left to change it to clear cam.
  Normally set this switch to the right.

- S103 (PGM GAIN) switch
  This switch is used to change the gain of the program audio.
  Turn the switch to the right to change the gain to 0 dBm and to the left to change it to − 20 dBm.
  Normally set this switch to the right.

- S104 (ENG RTS TERM) switch
  Turn this switch to the right for termination.
  Normally set this switch to the right.

- S105 (PD RTS TERM) switch
  Turn this switch to the right for termination.
  Normally set this switch to the right.

DT-19



- S1 (R, B CH TEST SELECT) switch
  This switch can be used to select the test waveform of CCU R and B CH when S8 on the board panel is set to TEST.

- S2 (G CH TEST SELECT) switch
  This switch can be used to select the test waveform of CCU G CH when S8 on the board panel is set to TEST.

- S3 (G PHASE MORE "2") switch
  This switch can be used to change the H phase of G CH against R and B CH.
  Always set this switch to 2.

- S4 (R CH TEST LEVEL) switch
  This switch can be used to adjust the level of the test waveform.
  Normally set this switch to 0.

- S5 (G CH TEST LEVEL) switch
  This switch can be used to adjust the level of the test waveform.
  Normally set this switch to 0.

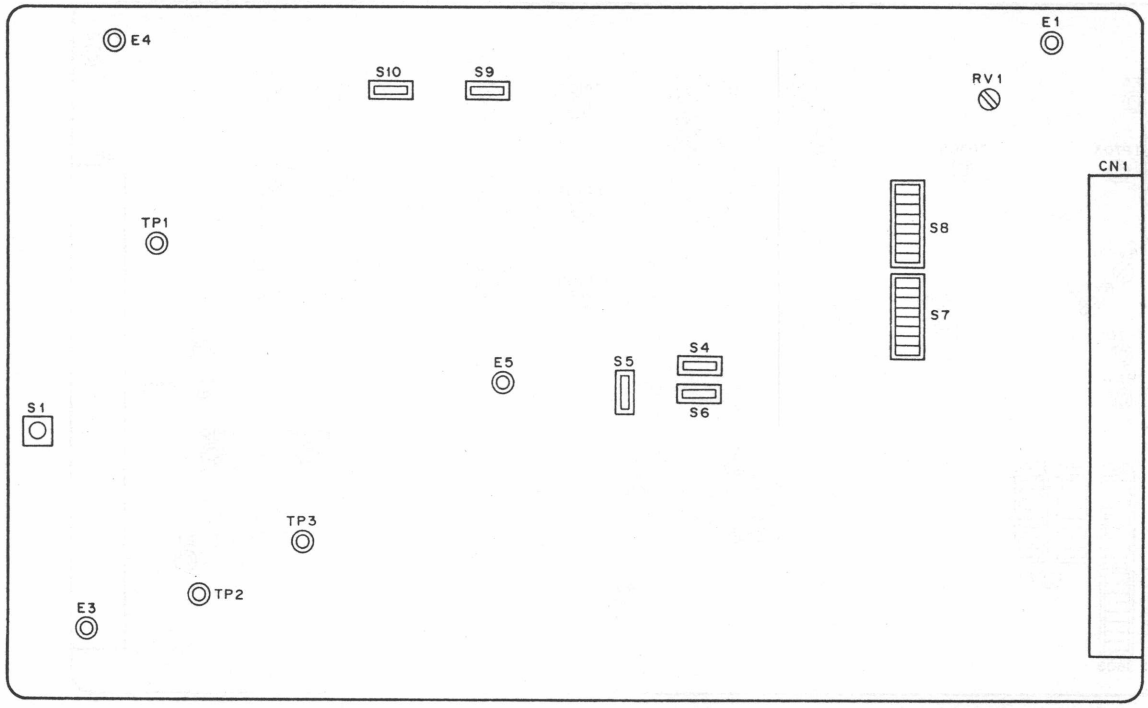
- S6 (B CH TEST LEVEL) switch
  This switch can be used to adjust the level of the test waveform.
  Normally set this switch to 0.

- S7 (DIE MODE) switch
  Don't change the initial settings, since these switches are used for a design.

7-1	Always ON
7-2	Always ON
7-3	Linearity ON/OFF Normally OFF
7-4	Always ON
7-6	Linearity alternates every 1H ON : Alternates every 1H OFF : All H Normally OFF
7-5	Always ON
7-7	Always ON

- S8 (TEST MODE) switch
  This switch is used to change the mode during CHU test.
  Upper position : Color bar and image from the CHU are changed alternately every 1H.
  Middle position : Color bar
  Lower position : Test waveform is selected by S1 and S2.
  Normally set this switch to the middle position.

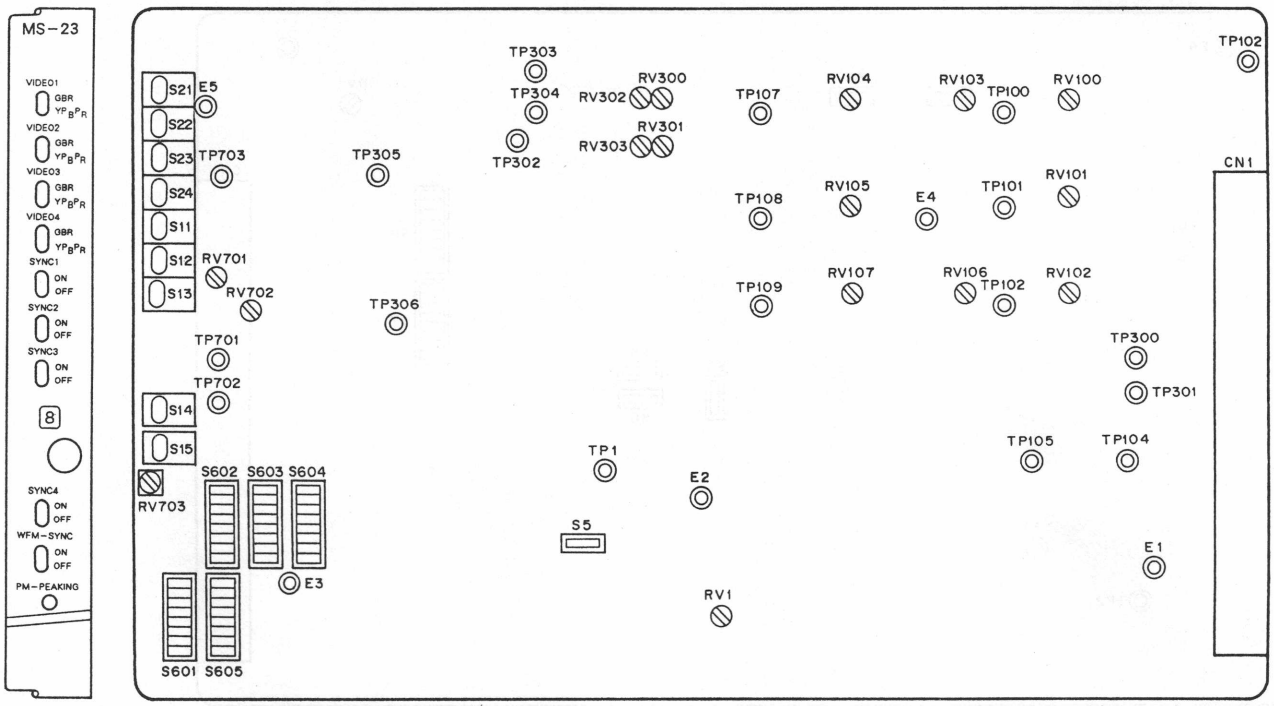
IF-212



- S9 (CONTACT/POWER) switch
  CONTACT : Corresponded to the use of a contact tally.
  POWER : Corresponded to the used of a power supply.
  Normally set this switch to POWER.

- S10 (CONTACT/POWER) switch
  CONTACT : Corresponded to the use of a contact tally.
  POWER : Corresponded to the used of a power supply.
  Normally set this switch to POWER.

MS-23



- S5 (REMOTE/LOCAL) switch
  REMOTE : The waveform monitor, picture monitor, view finder signal, monitor marker, and cursor are controlled on the control panel.
  LOCAL : The above functions is controlled by S601 to S605.
  Normally set this switch to REMOTE.

- S11 (SYNC 1) switch
  This switch is used to indicate whether the synchronous signal is attached to the signal output from G (Y) /B (P_B) /R (P_R) OUT 1.
  Normally set this switch to ON.

S601 through S605 switches are used to set the various modes which are normally set by the control panel via CPU. These modes, however, can be set by these switches on boards when S5 is set to LOCAL. Each switches has a mode as follows :

S601

601-1 (XSTORER)	Remote control of 1730HD waveform monitor (Refer to the 1730HD manual.)
601-2 (RECALL 0)	
601-3 (RECALL 1)	
601-4 (XCH3)	
601-5 (XCH2)	
601-6 (XCH1)	
601-7 (A1/XB)	
601-8 (XBOTH)	

S602

6602-1 (X OUT)	Output enabled.
602-2 (PEAKING)	Picture monitor peaking
602-3 (Not used)	–
602-4 (RGB3/XY)	Change the waveform monitor output RGB/Y_BP_R
602-5 (X4)	Remote control of 1730HD waveform monitor (Refer to the 1730HD manual.)
602-6 (X3)	
602-7 (1/X2)	
602-8 (L/XF)	

S603

603-1 (VF NAM)	Selects NAM for VIEW FINDER
603-2 (PM NAM)	Selects NAM for PICTURE MONITOR
603-3 (PM B-G)	Selects B-G for PICTURE MONITOR
603-4 (PM R-G)	Selects R-G for PICTURE MONITOR
603-5 (PM Y)	Selects Y for PICTURE MONITOR
603-6 (PM B)	Selects B for PICTURE MONITOR
603-7 (PM G)	Selects G for PICTURE MONITOR
603-8 (PM R)	Selects R for PICTURE MONITOR

S604

604-1 (VF RET 2)	Selects RETURN 2 for VIEW FINDER
604-2 (VF RET 1)	Selects RETURN 1 for VIEW FINDER
604-3 (VF B-G)	Selects B-G for VIEW FINDER
604-4 (VF R-G)	Selects R-G for VIEW FINDER
604-5 (VF Y)	Selects Y for VIEW FINDER
604-6 (VF B)	Selects B for VIEW FINDER
604-7 (VF G)	Selects G for VIEW FINDER
604-8 (VF R)	Selects R for VIEW FINDER

S605

605-1 (MIX-PM)	Superimposition of the cursor, etc. selected by SG-140 for PICTURE MONITOR
605-2 (MIX-VF)	Superimposition of the cursor, etc. selected by SG-140 for VIEW FINDER

- S12 (SYNC 2) switch
  This switch is used to indicate whether the synchronous signal is attached to the signal output from G (Y) /B (P_B) /R (P_R) OUT 2.
  Normally set this switch to ON.

- S13 (SYNC 3) switch
  This switch is used to indicate whether the synchronous signal is attached to the signal output from G (Y) /B (P_B) /R (P_R) OUT 3.
  Normally set this switch to ON.

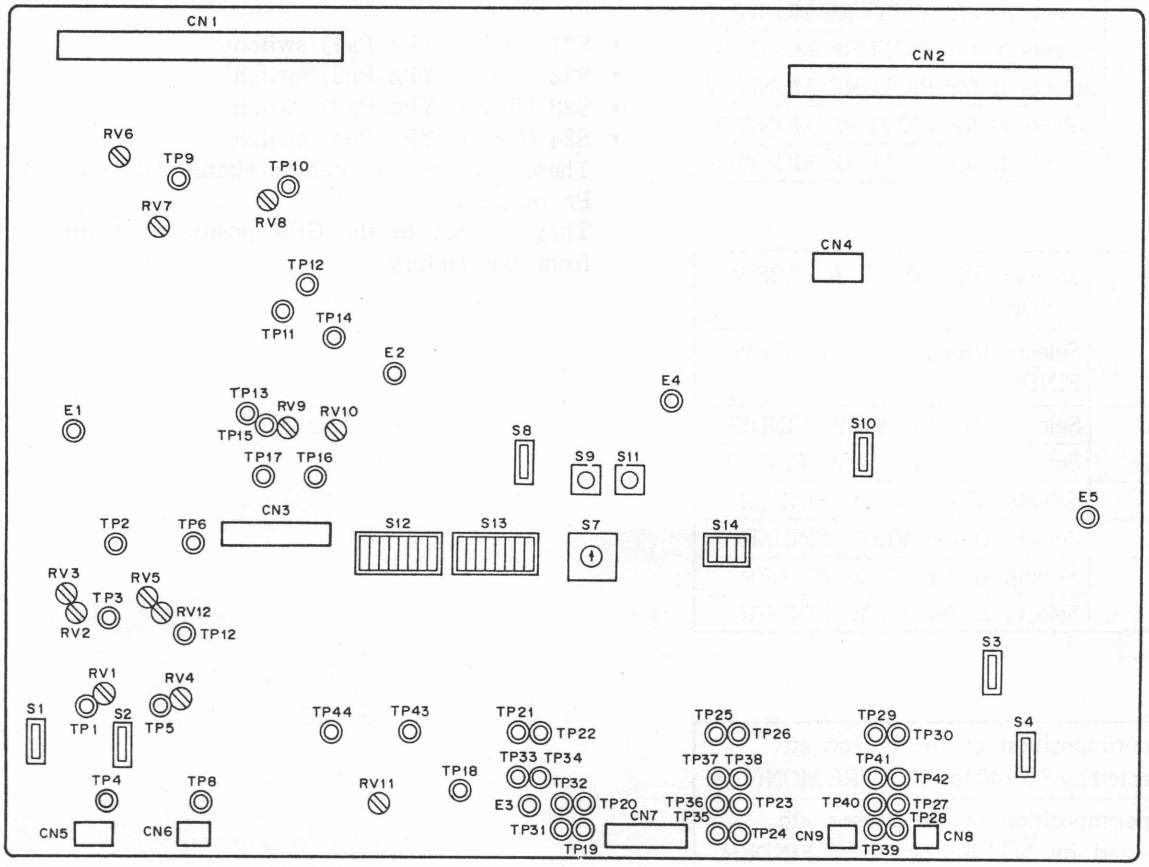
- S14 (SYNC 4) switch
  This switch is used to indicate whether the synchronous signal is attached to the signal output from G (Y) /B (P_B) /R (P_R) OUT 4.
  Normally set this switch to ON.

- S15 (WFM SYNC) switch
  This switch is used to indicate whether the synchronous signal is attached to the signal output from WFM OUT.
  Normally set this switch to ON.

- S21 (GBR1/YP_B P_R1) switch
- S22 (GBR2/YP_B P_R2) switch
- S23 (GBR3/YP_B P_R3) switch
- S24 (GBR4/YP_B P_R4) switch
  These switches are used to change GBR, YP_B and P_R outputs.
  They are set to the GBR positions at shipment from the factory.

HDC0-300

CP-130



- S1 (CARBON/DYNAMIC) switch
- S2 (CARBON/DYNAMIC) switch
  Set these switches depending on the type of microphone, either carbon or dynamic.
  Normally set this switch to CARBON.

- S3 (BUZZER) switch
  TEST : The buzzer is kept sounding. This status should be set to check that the buzzer sounds.
  NORMAL : The buzzer sounds when the BUZZER CONT signal is generated.
  Normally set this switch to NORMAL.

- S4 (BUZZER) switch
  This switch is used to detect the RTS signal and indicate it with the buzzer.
  The volume of the buzzer can be set to either of two levels, HIGH or LOW.
  Normally set the volume to LOW.

- S7 (FREQ) switch
  This switch is used to change the frequency of the clock used by the CPU. (However, it is not available now.)
  Normally set this switch to 0.

- S8 (CPU 1 NORMAL/TEST) switch
  NORMAL : The system is operated by the CPU on the board.
  TEST : The board operation can be checked with the emulator.
  Normally set this switch to NORMAL.

- S9 (CPU 1 RESET) switch
  This switch is used to reset CPU 1.

- S10 (CPU 2 NORMAL/TEST) switch
  NORMAL : The system is operated by the CPU on the board.
  TEST : The board operation can be checked with the emulator.
  Normally set this switch to NORMAL.

- S11 (CPU 2 RESET) switch
  This switch is used to reset CPU 2.

- S12 (MODE SELECT) switch

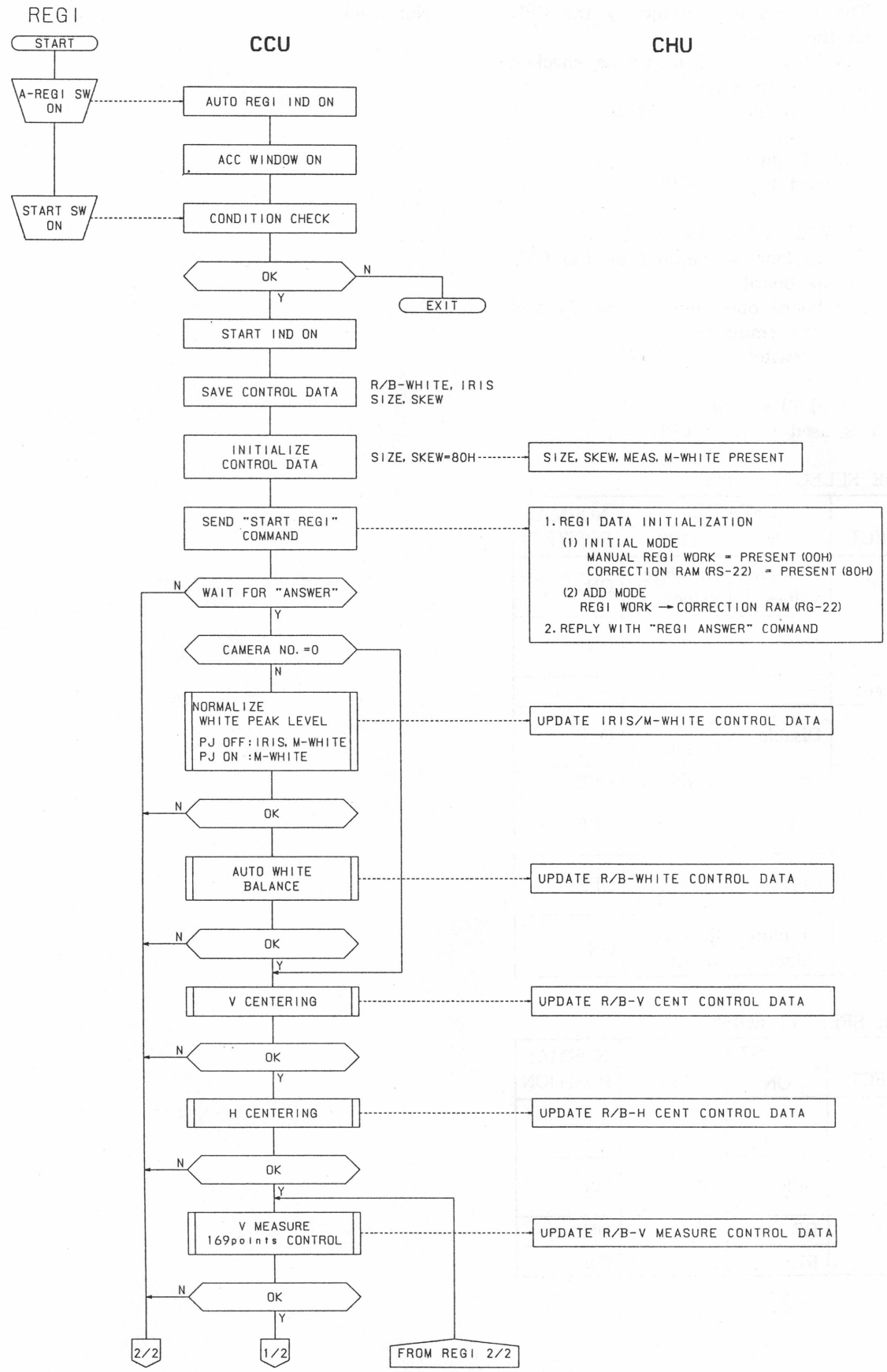
S12 MODE SELECT	STATUS		NORMAL POSITION
	ON	OFF	
12-1 (Painting)	Relative values	Absolute values	ON
12-2 (Monitor Select)	GBR	RGB	ON
12-3 (Not used)	–	–	–
12-4 (Regi)	Disable	Paint Enable	OFF
12-5 (Regi)	Disable	Enable	OFF
12-6 (Command Error Indication)	Yes	No	OFF
12-7 (IRIS During CCU Test)	OPEN	CLOSE	OFF
12-8 (Scene File)	Absolute values	Relative values	ON

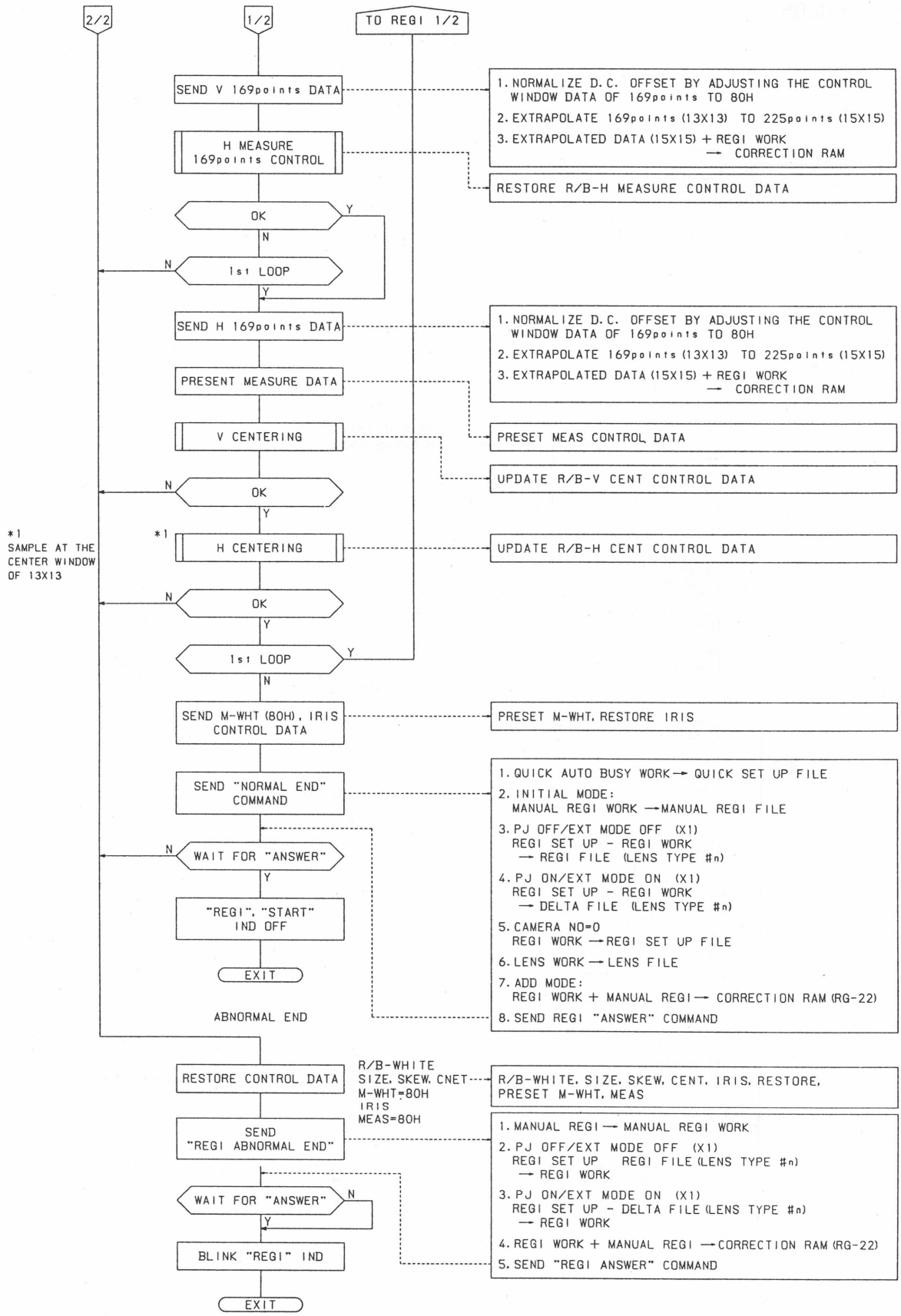
- S13 (MODE SELECT) switch

S13 MODE SELECT	STATUS		NORMAL POSITION
	ON	OFF	
13-1 to 13-5 (Not used)	–	–	–
13-6 (TALLY BUZZER)	OFF	ON	ON
13-7 (FOCUS)	RE	RV	ON
13-8 (IRIS)	RE	RV	ON

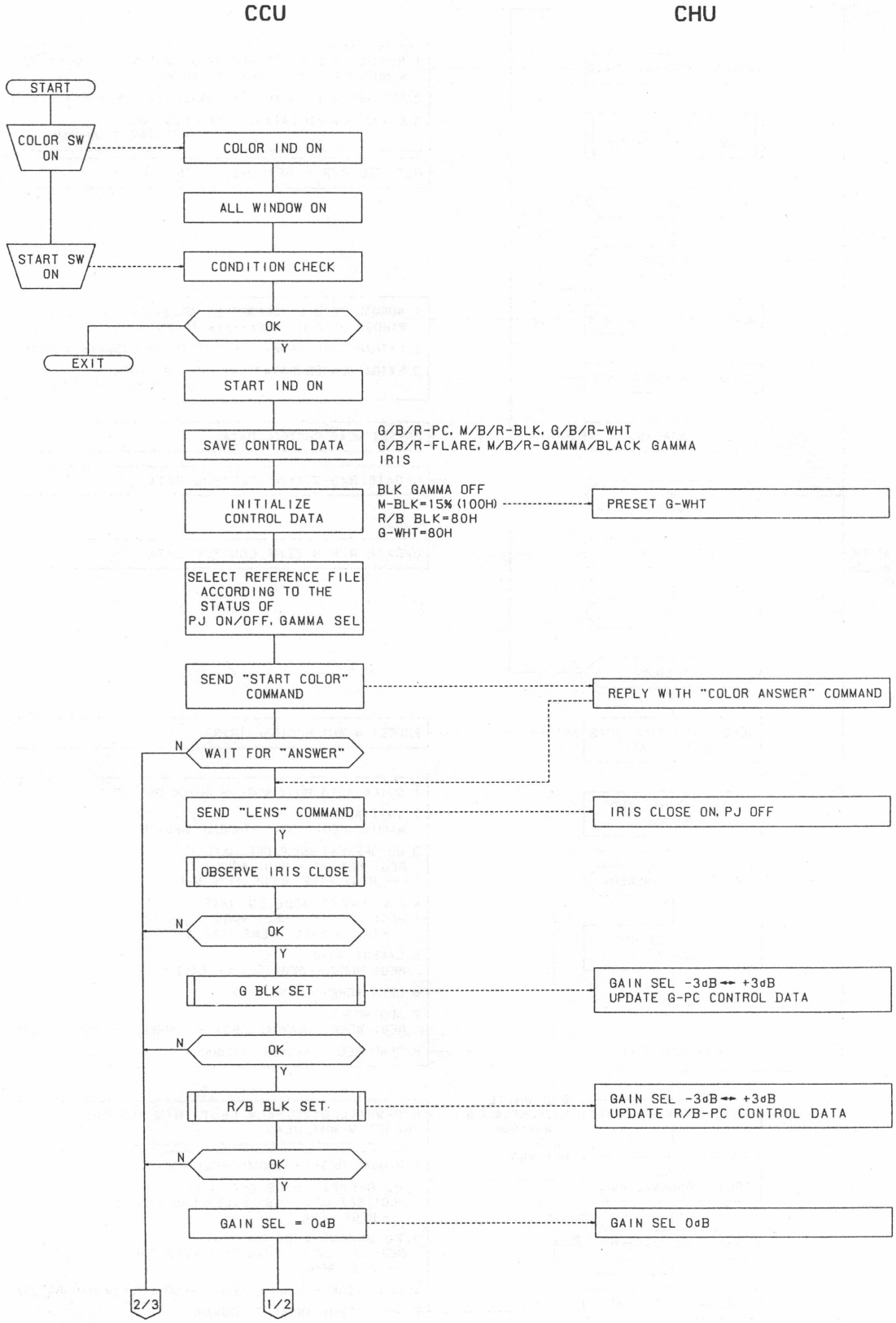
- S14 (MODE SELECT) switch
  Not used.

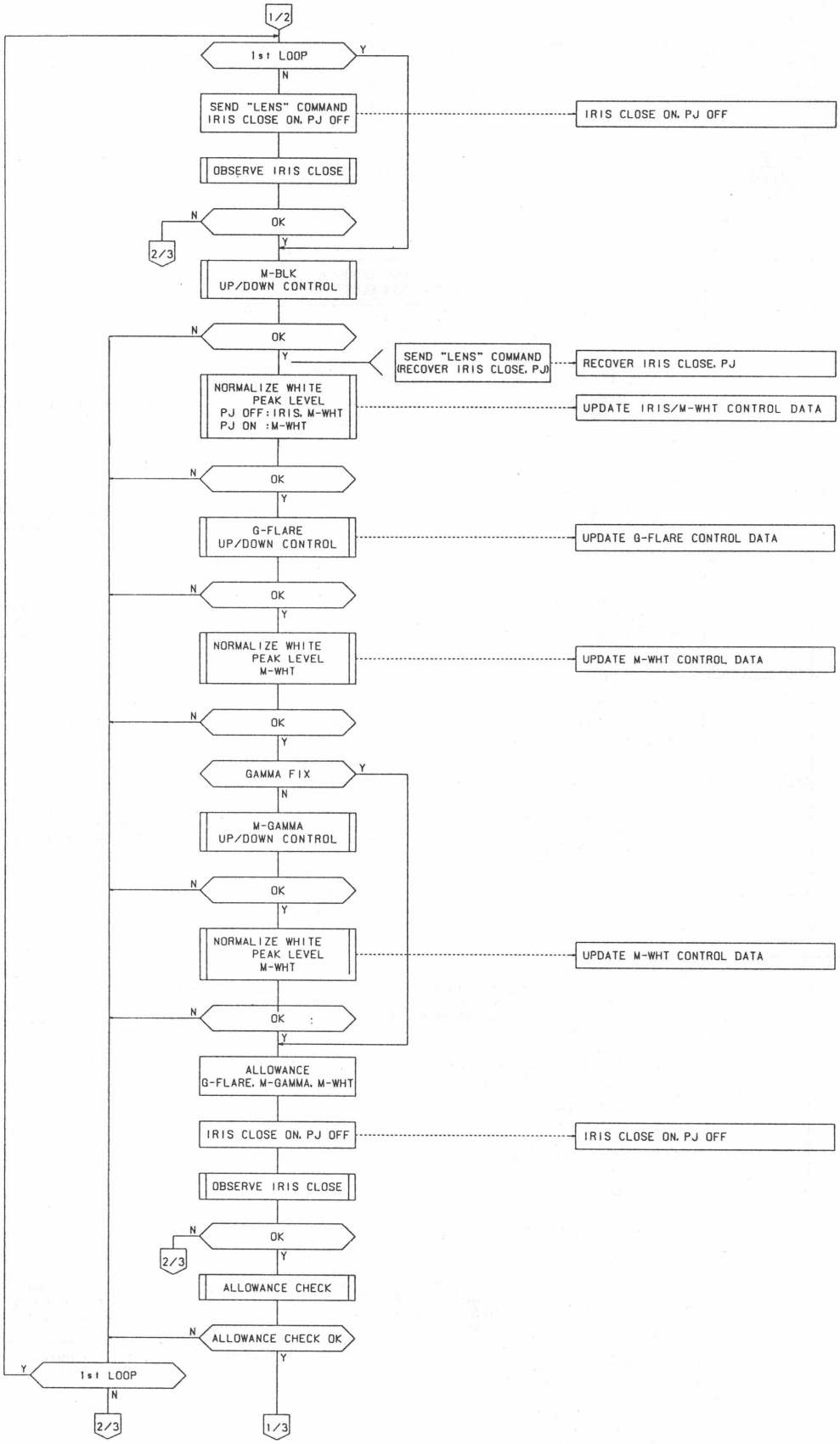
1-8-2. Reference File and Setup File Setting

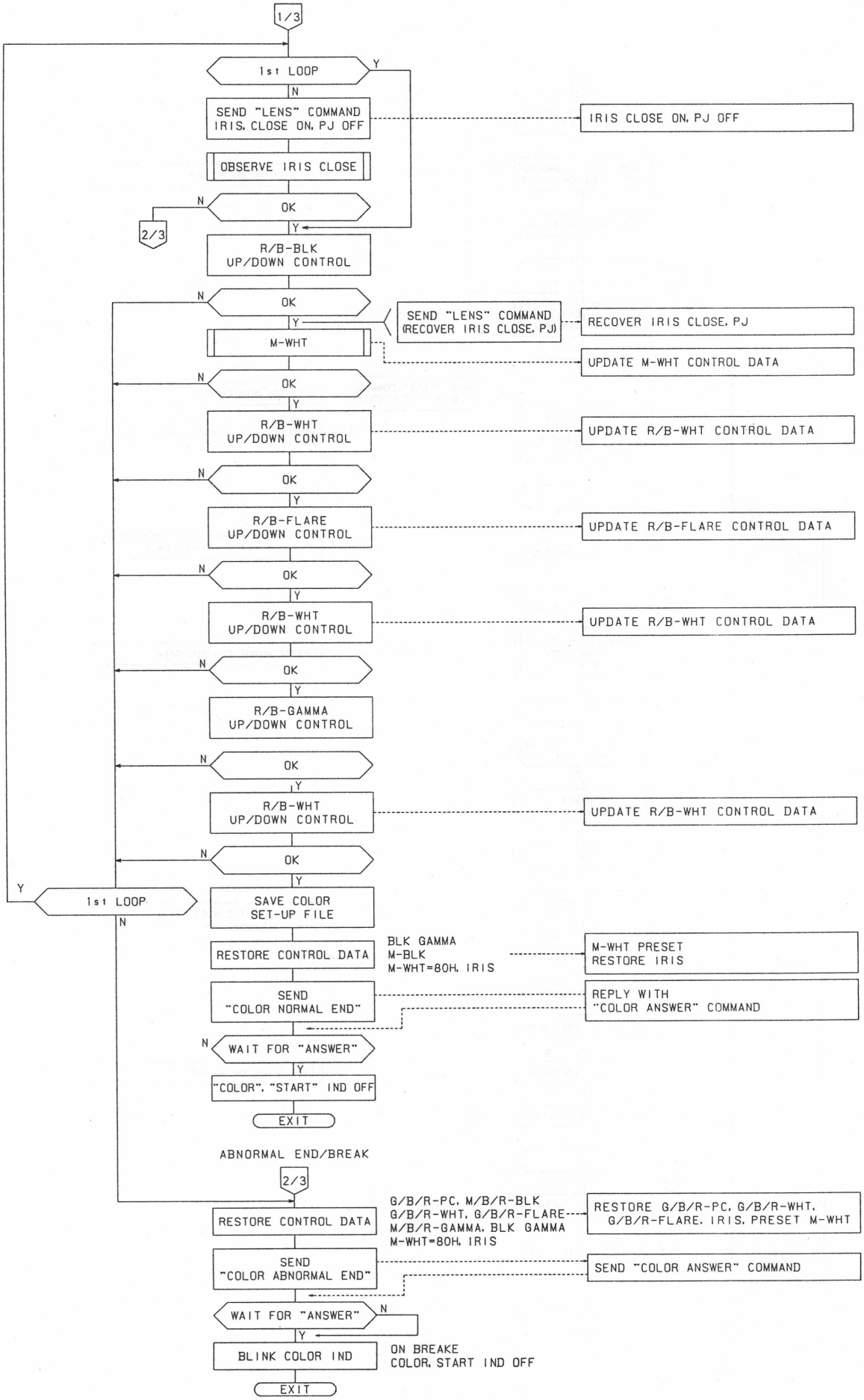



2/2
1/2
TO REGI 1/2
SEND V 169points DATA
1. NORMALIZE D.C. OFFSET BY ADJUSTING THE CONTROL WINDOW DATA OF 169points TO 80H
2. EXTRAPOLATE 169points (13X13) TO 225points (15X15)
3. EXTRAPOLATED DATA (15X15) + REGI WORK → CORRECTION RAM
H MEASURE 169points CONTROL
RESTORE R/B-H MEASURE CONTROL DATA
OK
Y
N
N
1st LOOP
Y
SEND H 169points DATA
1. NORMALIZE D.C. OFFSET BY ADJUSTING THE CONTROL WINDOW DATA OF 169points TO 80H
2. EXTRAPOLATE 169points (13X13) TO 225points (15X15)
3. EXTRAPOLATED DATA (15X15) + REGI WORK → CORRECTION RAM
PRESENT MEASURE DATA
V CENTERING
PRESET MEAS CONTROL DATA
UPDATE R/B-V CENT CONTROL DATA
N
OK
Y
*1
SAMPLE AT THE CENTER WINDOW OF 13X13
*1
H CENTERING
UPDATE R/B-H CENT CONTROL DATA
N
OK
Y
1st LOOP
Y
N
SEND M-WHT (80H), IRIS CONTROL DATA
PRESET M-WHT, RESTORE IRIS
SEND "NORMAL END" COMMAND
1. QUICK AUTO BUSY WORK → QUICK SET UP FILE
2. INITIAL MODE:
MANUAL REGI WORK → MANUAL REGI FILE
3. PJ OFF/EXT MODE OFF (X1)
REGI SET UP - REGI WORK
→ REGI FILE (LENS TYPE #n)
4. PJ ON/EXT MODE ON (X1)
REGI SET UP - REGI WORK
→ DELTA FILE (LENS TYPE #n)
5. CAMERA NO=0
REGI WORK → REGI SET UP FILE
6. LENS WORK → LENS FILE
7. ADD MODE:
REGI WORK + MANUAL REGI → CORRECTION RAM (RG-22)
8. SEND REGI "ANSWER" COMMAND
N
WAIT FOR "ANSWER"
Y
"REGI", "START" IND OFF
EXIT
ABNORMAL END
RESTORE CONTROL DATA
R/B-WHITE
SIZE, SKEW, CNET
M-WHT=80H
IRIS
MEAS=80H
R/B-WHITE, SIZE, SKEW, CENT, IRIS, RESTORE, PRESET M-WHT, MEAS
SEND "REGI ABNORMAL END"
1. MANUAL REGI → MANUAL REGI WORK
2. PJ OFF/EXT MODE OFF (X1)
REGI SET UP REGI FILE (LENS TYPE #n)
→ REGI WORK
3. PJ ON/EXT MODE ON (X1)
REGI SET UP - DELTA FILE (LENS TYPE #n)
→ REGI WORK
4. REGI WORK + MANUAL REGI → CORRECTION RAM (RG-22)
5. SEND "REGI ANSWER" COMMAND
WAIT FOR "ANSWER"
N
Y
BLINK "REGI" IND
EXIT

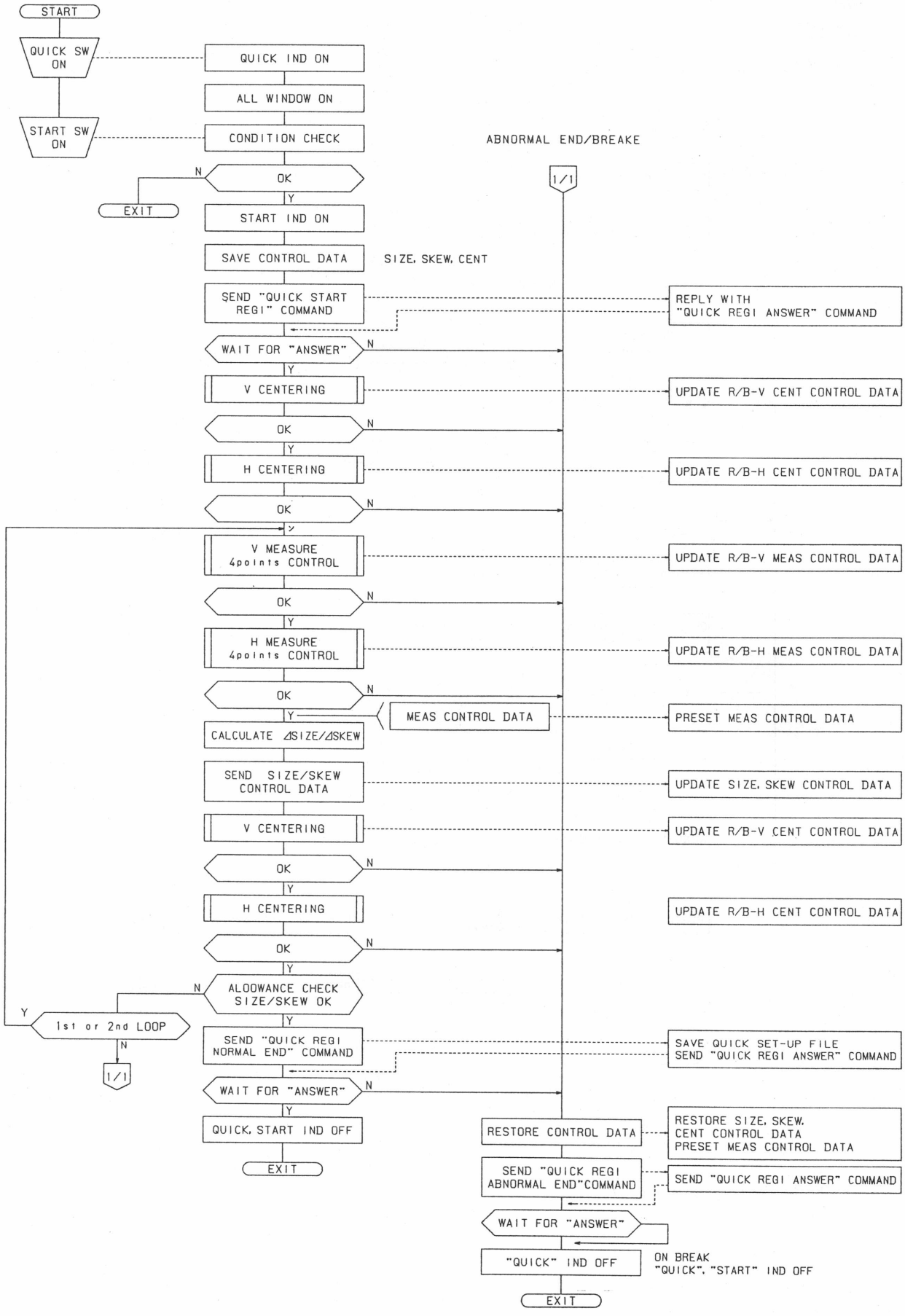
AUTO COLOR

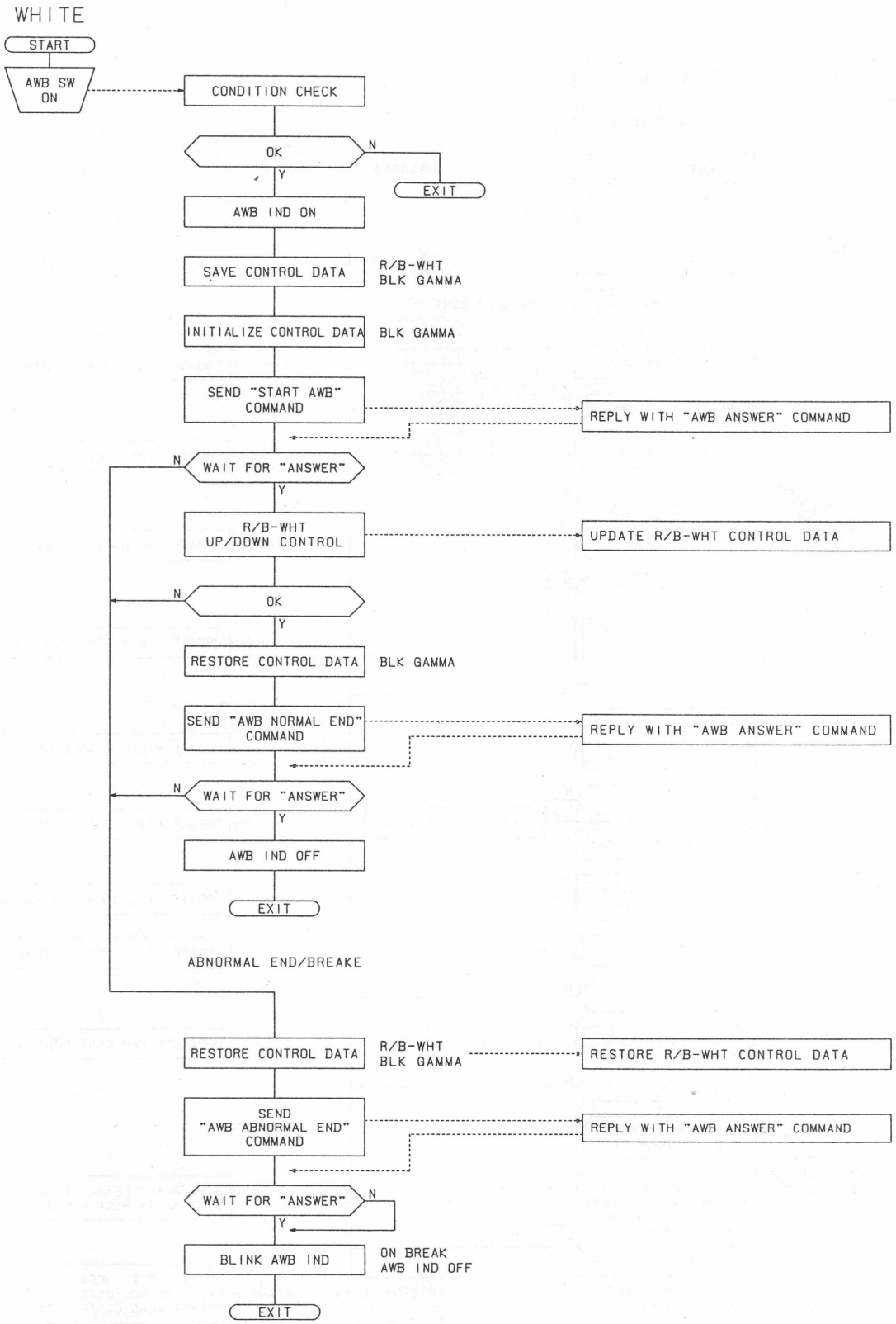

CCU
CHU
START
COLOR SW ON
COLOR IND ON
ALL WINDOW ON
START SW ON
CONDITION CHECK
OK
EXIT
Y
START IND ON
SAVE CONTROL DATA
G/B/R-PC, M/B/R-BLK, G/B/R-WHT
G/B/R-FLARE, M/B/R-GAMMA/BLACK GAMMA
IRIS
INITIALIZE CONTROL DATA
BLK GAMMA OFF
M-BLK=15% (100H)
R/B BLK=80H
G-WHT=80H
PRESET G-WHT
SELECT REFERENCE FILE ACCORDING TO THE STATUS OF PJ ON/OFF, GAMMA SEL
SEND "START COLOR" COMMAND
REPLY WITH "COLOR ANSWER" COMMAND
N
WAIT FOR "ANSWER"
SEND "LENS" COMMAND
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
OK
G BLK SET
GAIN SEL -3dB ↔ +3dB
UPDATE G-PC CONTROL DATA
R/B BLK SET
GAIN SEL -3dB ↔ +3dB
UPDATE R/B-PC CONTROL DATA
GAIN SEL = 0dB
GAIN SEL 0dB
2/3
1/2

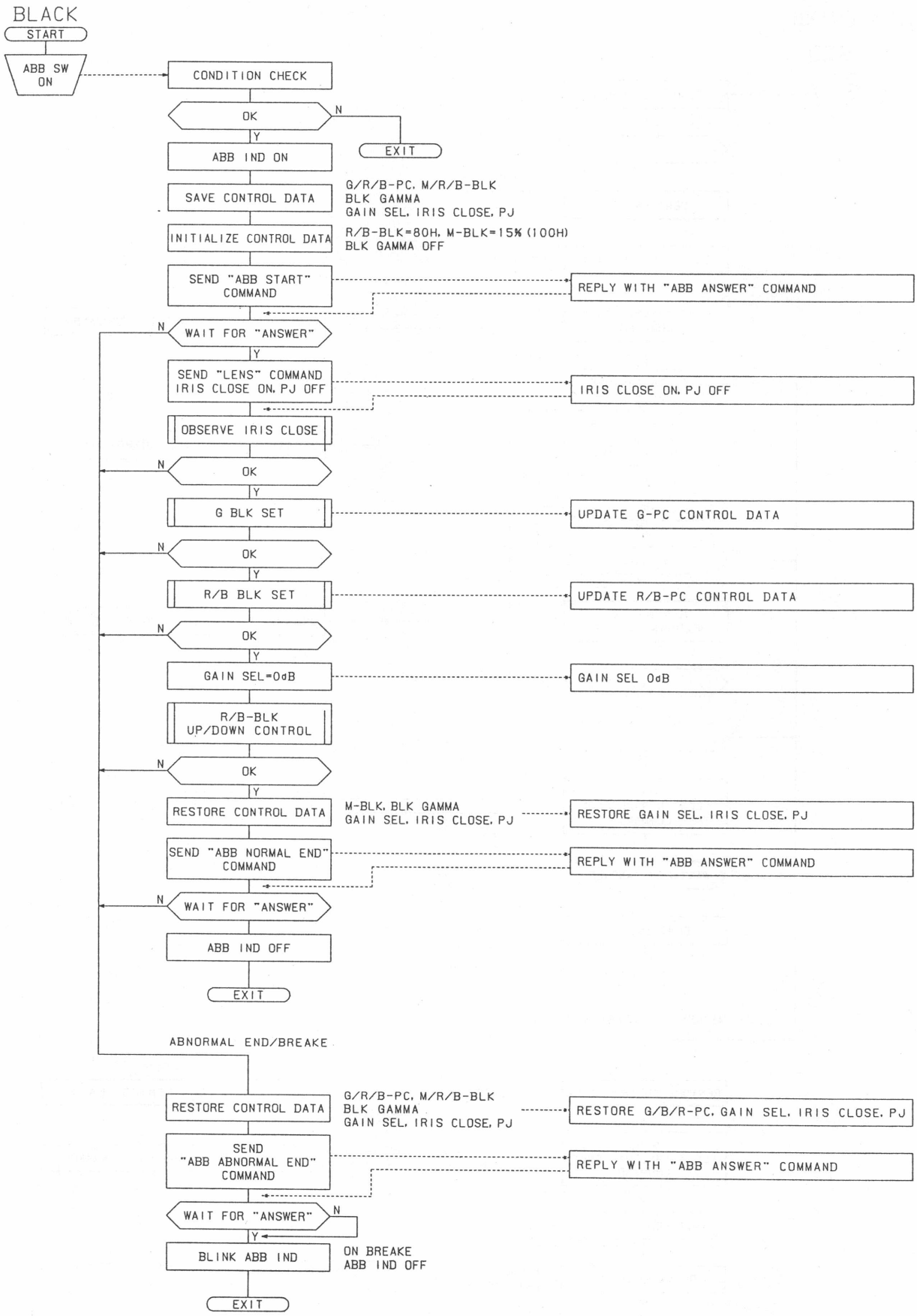

1/2
1st LOOP
Y
N
SEND "LENS" COMMAND
IRIS CLOSE ON, PJ OFF
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
N
OK
Y
2/3
M-BLK
UP/DOWN CONTROL
N
OK
Y
SEND "LENS" COMMAND
(RECOVER IRIS CLOSE, PJ)
RECOVER IRIS CLOSE, PJ
NORMALIZE WHITE
PEAK LEVEL
PJ OFF : IRIS, M-WHT
PJ ON : M-WHT
UPDATE IRIS/M-WHT CONTROL DATA
N
OK
Y
G-FLARE
UP/DOWN CONTROL
UPDATE G-FLARE CONTROL DATA
N
OK
Y
NORMALIZE WHITE
PEAK LEVEL
M-WHT
UPDATE M-WHT CONTROL DATA
N
OK
Y
GAMMA FIX
Y
N
M-GAMMA
UP/DOWN CONTROL
N
OK
Y
NORMALIZE WHITE
PEAK LEVEL
M-WHT
UPDATE M-WHT CONTROL DATA
N
OK
Y
ALLOWANCE
G-FLARE, M-GAMMA, M-WHT
IRIS CLOSE ON, PJ OFF
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
N
OK
Y
2/3
ALLOWANCE CHECK
N
ALLOWANCE CHECK OK
Y
Y
1st LOOP
N
2/3
1/3


1/3
1st LOOP
Y
N
SEND "LENS" COMMAND
IRIS, CLOSE ON, PJ OFF
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
N
OK
2/3
Y
R/B-BLK
UP/DOWN CONTROL
N
OK
Y
SEND "LENS" COMMAND
(RECOVER IRIS CLOSE, PJ)
RECOVER IRIS CLOSE, PJ
M-WHT
UPDATE M-WHT CONTROL DATA
N
OK
Y
R/B-WHT
UP/DOWN CONTROL
UPDATE R/B-WHT CONTROL DATA
N
OK
Y
R/B-FLARE
UP/DOWN CONTROL
UPDATE R/B-FLARE CONTROL DATA
N
OK
Y
R/B-WHT
UP/DOWN CONTROL
UPDATE R/B-WHT CONTROL DATA
N
OK
Y
R/B-GAMMA
UP/DOWN CONTROL
N
OK
Y
R/B-WHT
UP/DOWN CONTROL
UPDATE R/B-WHT CONTROL DATA
N
OK
Y
Y
1st LOOP
N
SAVE COLOR
SET-UP FILE
RESTORE CONTROL DATA
BLK GAMMA
M-BLK
M-WHT=80H, IRIS
M-WHT PRESET
RESTORE IRIS
SEND
"COLOR NORMAL END"
REPLY WITH
"COLOR ANSWER" COMMAND
N
WAIT FOR "ANSWER"
Y
"COLOR", "START" IND OFF
EXIT
ABNORMAL END/BREAK
2/3
RESTORE CONTROL DATA
G/B/R-PC, M/B/R-BLK
G/B/R-WHT, G/B/R-FLARE
M/B/R-GAMMA, BLK GAMMA
M-WHT=80H, IRIS
RESTORE G/B/R-PC, G/B/R-WHT,
G/B/R-FLARE, IRIS, PRESET M-WHT
SEND
"COLOR ABNORMAL END"
SEND "COLOR ANSWER" COMMAND
WAIT FOR "ANSWER"
N
Y
BLINK COLOR IND
ON BREAKE
COLOR, START IND OFF
EXIT

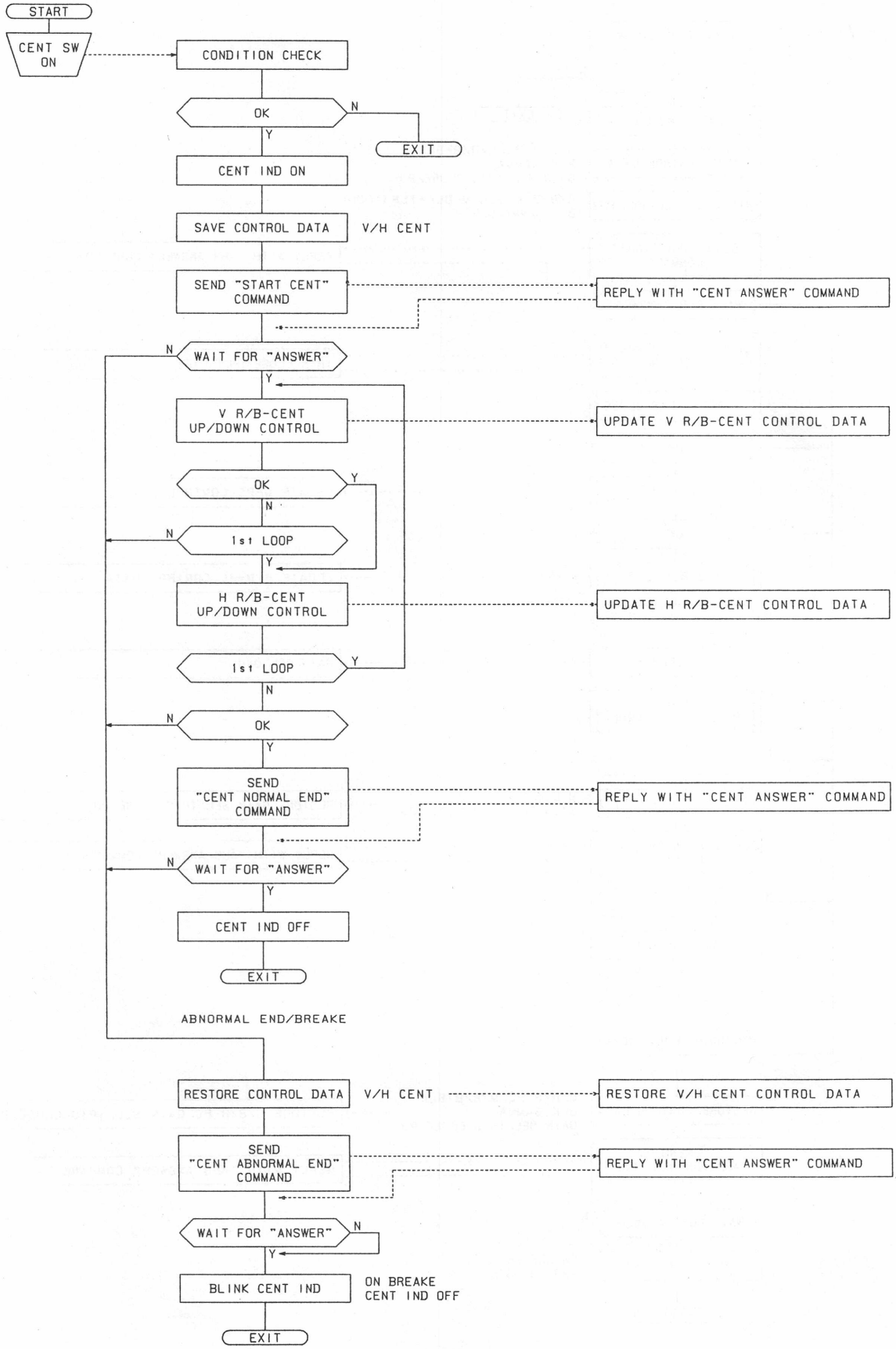
QUICK REGI


START
QUICK SW ON
QUICK IND ON
ALL WINDOW ON
START SW ON
CONDITION CHECK
ABNORMAL END/BREAKE
N
OK
1/1
EXIT
Y
START IND ON
SAVE CONTROL DATA
SIZE, SKEW, CENT
SEND "QUICK START REGI" COMMAND
REPLY WITH "QUICK REGI ANSWER" COMMAND
WAIT FOR "ANSWER"
N
Y
V CENTERING
UPDATE R/B-V CENT CONTROL DATA
OK
N
Y
H CENTERING
UPDATE R/B-H CENT CONTROL DATA
OK
N
Y
V MEASURE 4points CONTROL
UPDATE R/B-V MEAS CONTROL DATA
OK
N
Y
H MEASURE 4points CONTROL
UPDATE R/B-H MEAS CONTROL DATA
OK
N
Y
MEAS CONTROL DATA
PRESET MEAS CONTROL DATA
CALCULATE ΔSIZE/ΔSKEW
SEND SIZE/SKEW CONTROL DATA
UPDATE SIZE, SKEW CONTROL DATA
V CENTERING
UPDATE R/B-V CENT CONTROL DATA
OK
N
Y
H CENTERING
UPDATE R/B-H CENT CONTROL DATA
OK
N
Y
ALOOWANCE CHECK SIZE/SKEW OK
N
Y
1st or 2nd LOOP
Y
N
1/1
SEND "QUICK REGI NORMAL END" COMMAND
SAVE QUICK SET-UP FILE
SEND "QUICK REGI ANSWER" COMMAND
WAIT FOR "ANSWER"
N
Y
QUICK, START IND OFF
EXIT
RESTORE CONTROL DATA
RESTORE SIZE, SKEW, CENT CONTROL DATA PRESET MEAS CONTROL DATA
SEND "QUICK REGI ABNORMAL END"COMMAND
SEND "QUICK REGI ANSWER" COMMAND
WAIT FOR "ANSWER"
"QUICK" IND OFF
ON BREAK "QUICK", "START" IND OFF
EXIT

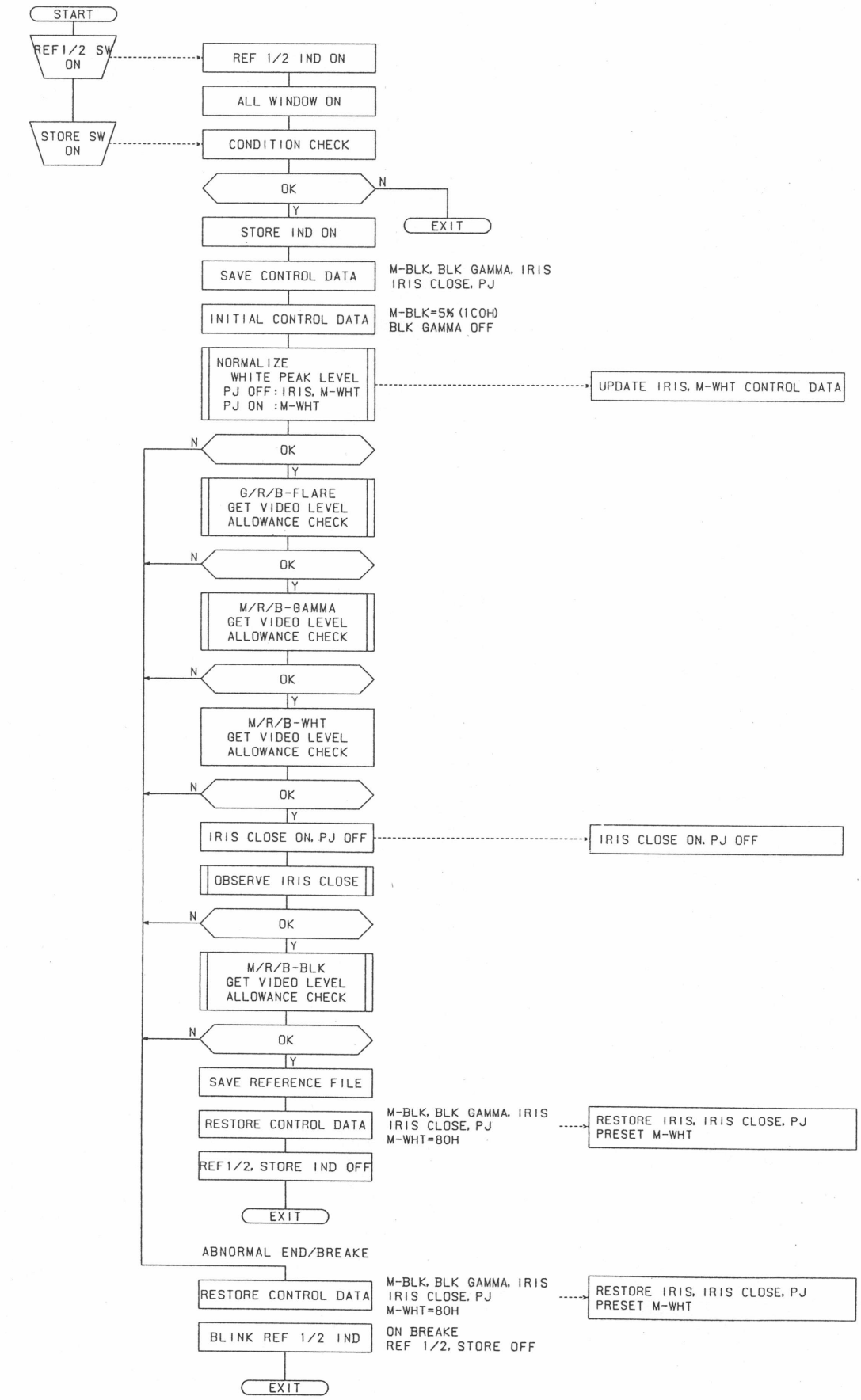

WHITE
START
AWB SW ON
CONDITION CHECK
OK
N
Y
EXIT
AWB IND ON
SAVE CONTROL DATA
R/B-WHT BLK GAMMA
INITIALIZE CONTROL DATA
BLK GAMMA
SEND "START AWB" COMMAND
REPLY WITH "AWB ANSWER" COMMAND
WAIT FOR "ANSWER"
R/B-WHT UP/DOWN CONTROL
UPDATE R/B-WHT CONTROL DATA
OK
RESTORE CONTROL DATA
BLK GAMMA
SEND "AWB NORMAL END" COMMAND
REPLY WITH "AWB ANSWER" COMMAND
WAIT FOR "ANSWER"
AWB IND OFF
EXIT
ABNORMAL END/BREAKE
RESTORE CONTROL DATA
R/B-WHT BLK GAMMA
RESTORE R/B-WHT CONTROL DATA
SEND "AWB ABNORMAL END" COMMAND
REPLY WITH "AWB ANSWER" COMMAND
WAIT FOR "ANSWER"
BLINK AWB IND
ON BREAK AWB IND OFF
EXIT


BLACK
START
ABB SW ON
CONDITION CHECK
OK
N
Y
EXIT
ABB IND ON
SAVE CONTROL DATA
G/R/B-PC, M/R/B-BLK
BLK GAMMA
GAIN SEL, IRIS CLOSE, PJ
INITIALIZE CONTROL DATA
R/B-BLK=80H, M-BLK=15% (100H)
BLK GAMMA OFF
SEND "ABB START" COMMAND
REPLY WITH "ABB ANSWER" COMMAND
WAIT FOR "ANSWER"
SEND "LENS" COMMAND
IRIS CLOSE ON, PJ OFF
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
G BLK SET
UPDATE G-PC CONTROL DATA
R/B BLK SET
UPDATE R/B-PC CONTROL DATA
GAIN SEL=0dB
GAIN SEL 0dB
R/B-BLK UP/DOWN CONTROL
RESTORE CONTROL DATA
M-BLK, BLK GAMMA
GAIN SEL, IRIS CLOSE, PJ
RESTORE GAIN SEL, IRIS CLOSE, PJ
SEND "ABB NORMAL END" COMMAND
ABB IND OFF
ABNORMAL END/BREAKE
RESTORE G/B/R-PC, GAIN SEL, IRIS CLOSE, PJ
SEND "ABB ABNORMAL END" COMMAND
BLINK ABB IND
ON BREAKE
ABB IND OFF

CENTERING


START
CENT SW ON
CONDITION CHECK
OK
N
Y
EXIT
CENT IND ON
SAVE CONTROL DATA
V/H CENT
SEND "START CENT" COMMAND
REPLY WITH "CENT ANSWER" COMMAND
WAIT FOR "ANSWER"
V R/B-CENT UP/DOWN CONTROL
UPDATE V R/B-CENT CONTROL DATA
1st LOOP
H R/B-CENT UP/DOWN CONTROL
UPDATE H R/B-CENT CONTROL DATA
SEND "CENT NORMAL END" COMMAND
CENT IND OFF
ABNORMAL END/BREAKE
RESTORE CONTROL DATA
RESTORE V/H CENT CONTROL DATA
SEND "CENT ABNORMAL END" COMMAND
BLINK CENT IND
ON BREAKE
CENT IND OFF

REFERENCE


START
REF1/2 SW ON
REF 1/2 IND ON
ALL WINDOW ON
STORE SW ON
CONDITION CHECK
OK
N
Y
EXIT
STORE IND ON
SAVE CONTROL DATA
M-BLK, BLK GAMMA, IRIS
IRIS CLOSE, PJ
INITIAL CONTROL DATA
M-BLK=5% (1COH)
BLK GAMMA OFF
NORMALIZE
WHITE PEAK LEVEL
PJ OFF: IRIS, M-WHT
PJ ON : M-WHT
UPDATE IRIS, M-WHT CONTROL DATA
OK
G/R/B-FLARE
GET VIDEO LEVEL
ALLOWANCE CHECK
M/R/B-GAMMA
M/R/B-WHT
M/R/B-BLK
IRIS CLOSE ON, PJ OFF
OBSERVE IRIS CLOSE
SAVE REFERENCE FILE
RESTORE CONTROL DATA
M-BLK, BLK GAMMA, IRIS
IRIS CLOSE, PJ
M-WHT=80H
RESTORE IRIS, IRIS CLOSE, PJ
PRESET M-WHT
REF1/2, STORE IND OFF
ABNORMAL END/BREAKE
BLINK REF 1/2 IND
ON BREAKE
REF 1/2, STORE OFF

SECTION 2
REPLACEMENT OF MAIN PARTS

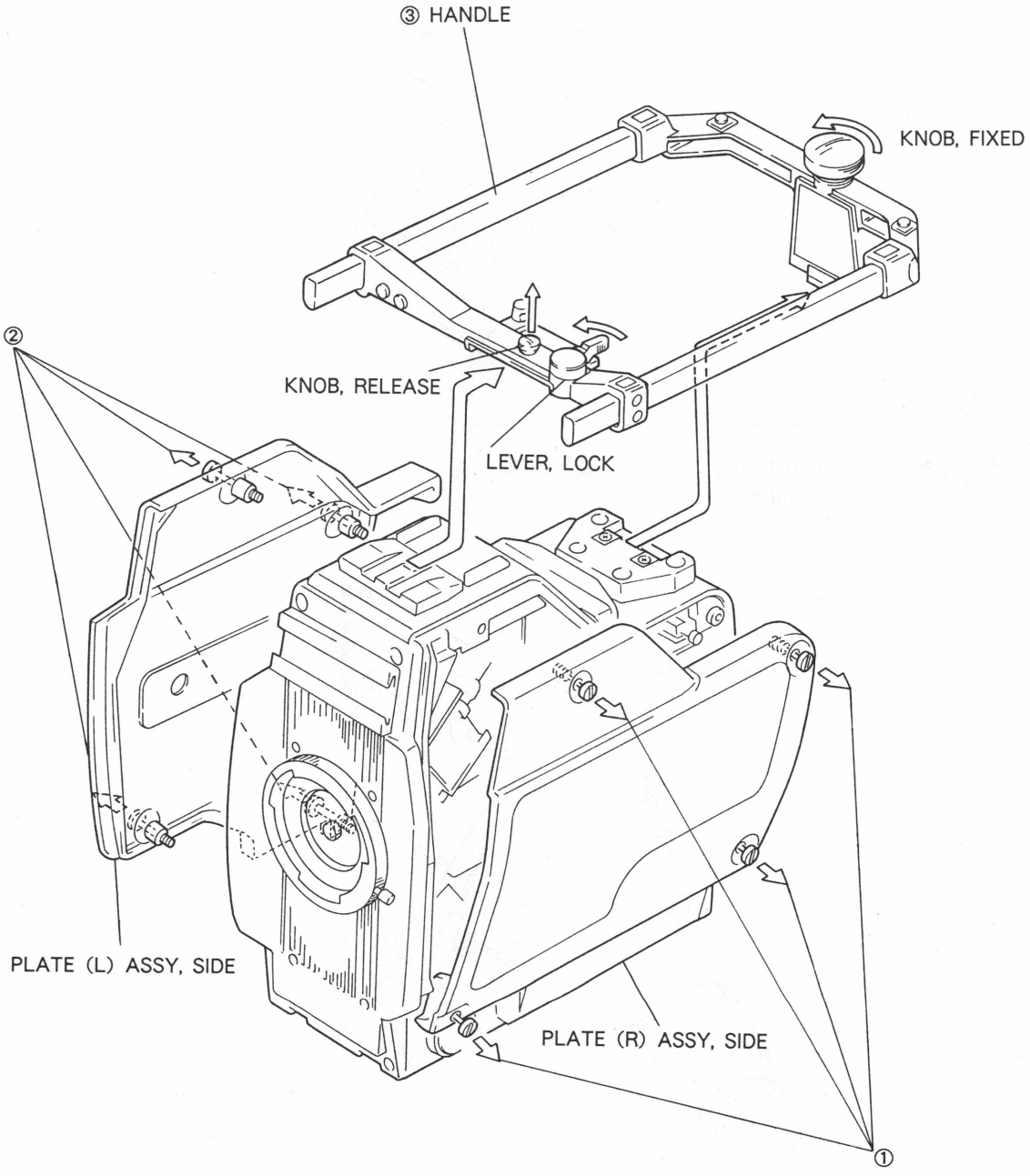
2-1. CABINET REMOVAL

HDC-300

① Loosen the four screws (M4 × 8) and open the SIDE PLATE (R) ASSY.

② Loosen the four screws (M4 × 8) and remove the SIDE PLATE (L) ASSY.

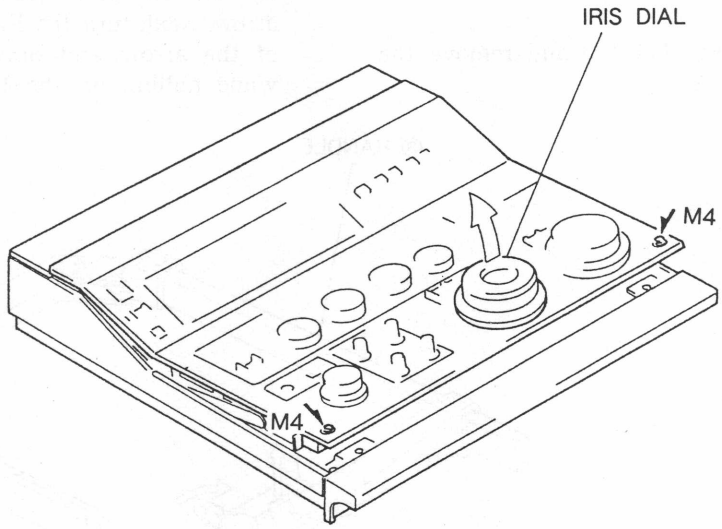
③ To detach the handle from the camera, first of all, turn the LOCK LEVER in the direction of the arrow. Next, turn the FIXED KNOB in the direction of the arrow, and draw the HANDLE backward while pulling up the RELEASE KNOB.



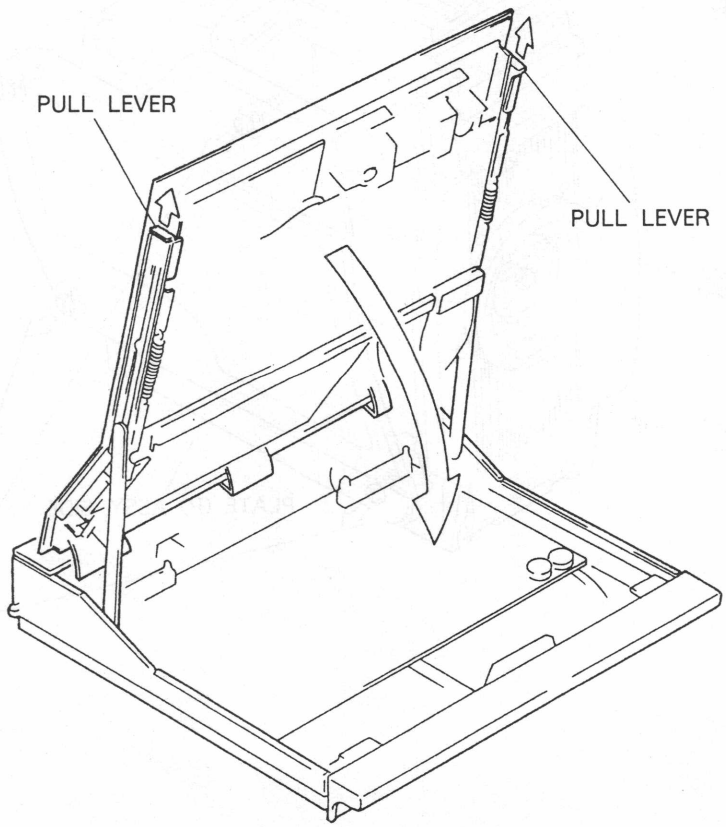
HDCO-300

OPENING AND SHUTTING THE CONTROL PANEL

① Loosen the two screws (M4). Lift up the panel holding the IRIS DIAL, until the panel locks.



② To shut the control panel, pull both the right and left PULL LEVER to unlock. Then, shut the panel carefully and tighten the two screws (M4).



HDCS-300

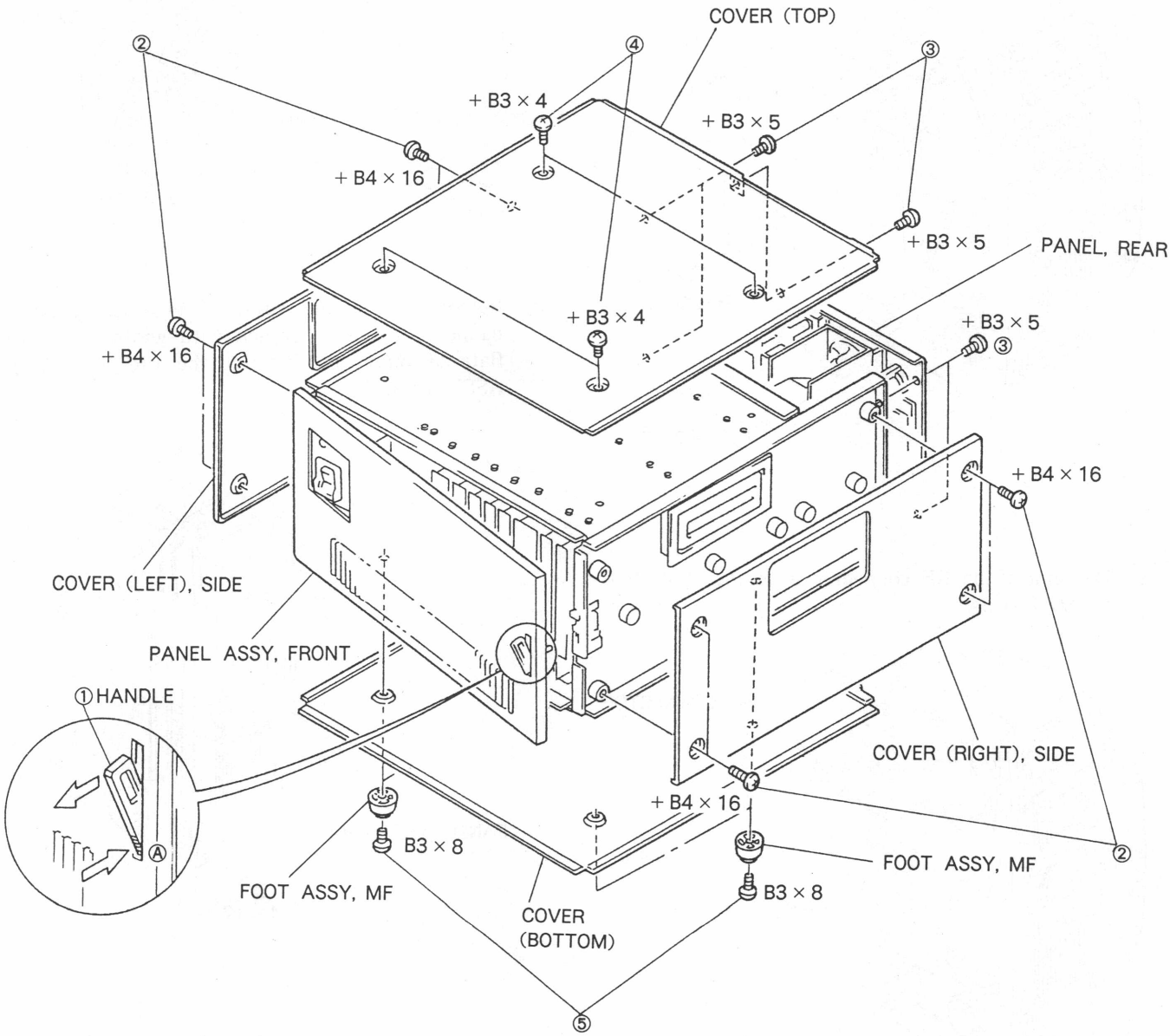
① Push a portion A to let a handle out. Pull the handle toward you and open the FRONT PANEL ASSY.

② To remove the RIGHT SIDE COVER or LEFT SIDE COVER, remove the four screws (+ B4 × 16) respectively.

③ Remove the six screws (+ B3 × 5) and remove the REAR PANEL.

④ Remove the four screws (+ B3 × 4) and remove the TOP COVER.

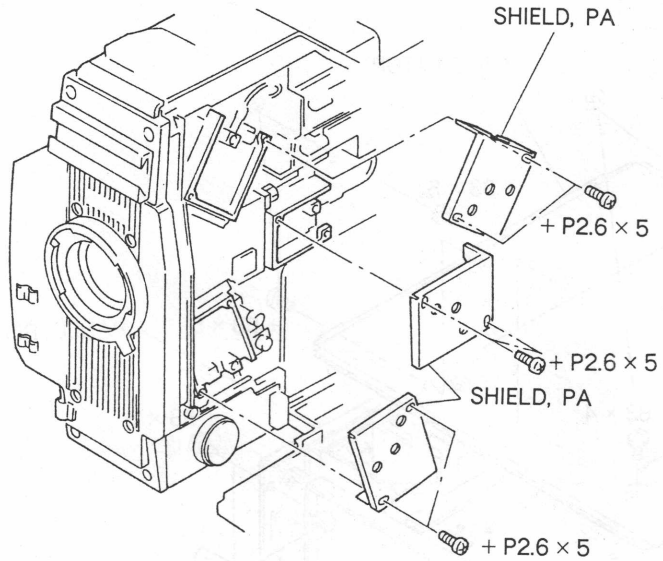
⑤ To remove the BOTTOM COVER, remove the four screws (+ B3 × 8) securing the MF FOOT ASSY and the BOTTOM COVER.



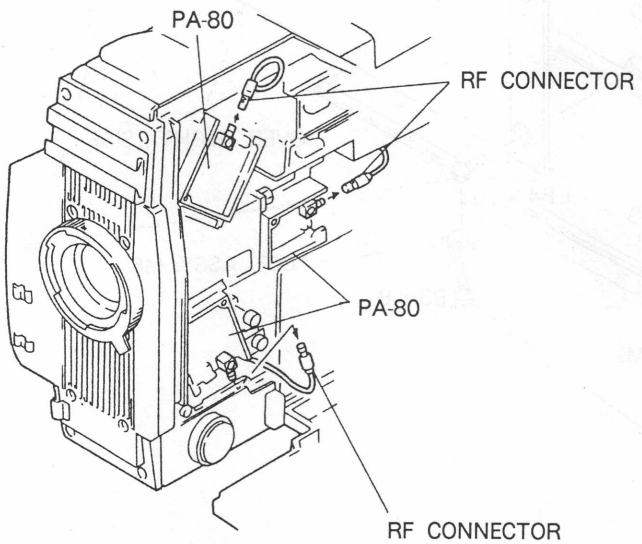
2-2. REMOVAL OF OPTICAL PRISM BLOCK (HDC-300)

1. Open the SIDE PLATE (R) ASSY and remove the SIDE PLATE (L) ASSY, referring to Section 2-1 "CABINET REMOVAL".

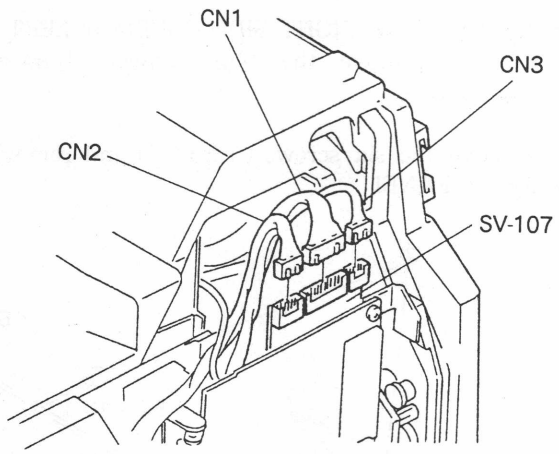
2. Remove the two screws (+ P2.6 × 5) securing the respective PA SHIELDs, and remove the three PA SHIELDs.



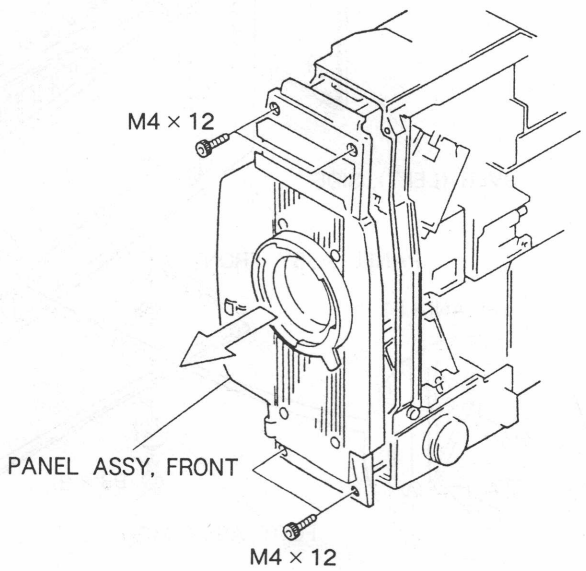
3. Disconnect the RF connector from the respective PA-80 boards.



4. Disconnect the three connectors, CN1, CN2 and CN3 from the SV-107 board.

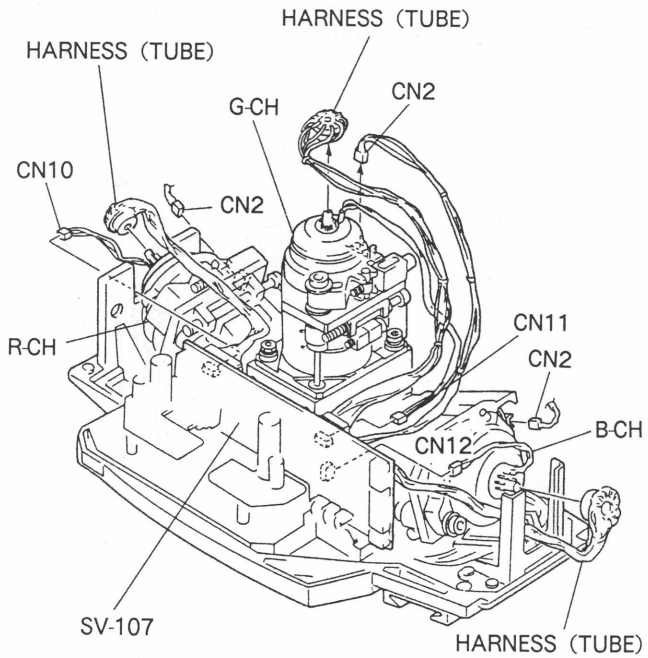


5. Remove the four screws (M4 × 12) using a ballpoint L-shaped wrench with width across the flats of 3mm, and extract the FRONT PANEL ASSY from the camera.

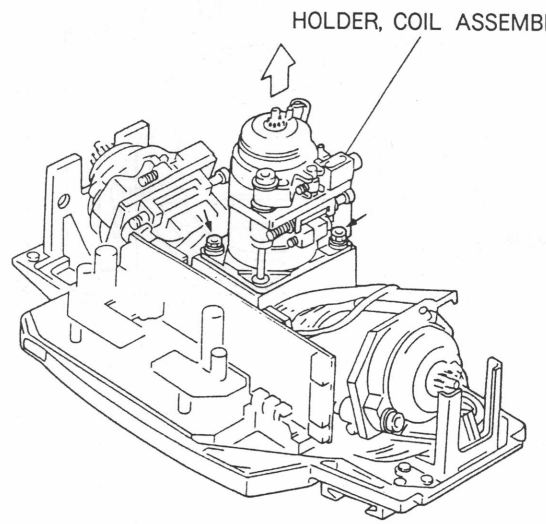


6. Disconnect the TUBE HARNESS from the respective pickup tubes and disconnect the connector CN2 from the respective PA-80 boards. Disconnect the three connectors, CN11 for G-CH, CN10 for R-CH and CN12 for B-CH from the SV-107 board.

Note : When disconnecting the CN12 for B-CH on the SV-107 board, carry out Step 7 prior to disconnection.

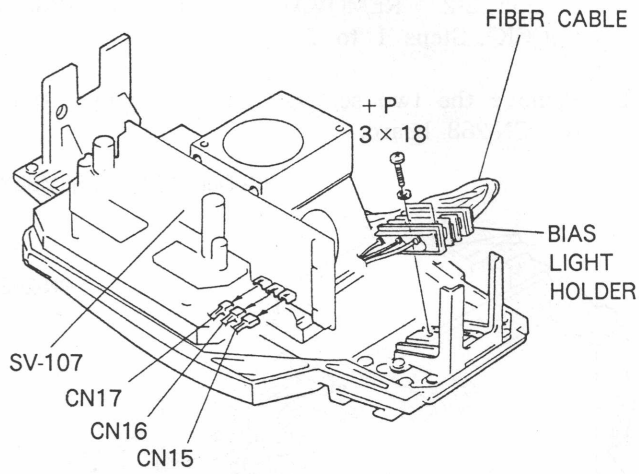


7. Loosen the two screws shown in the figure using a ballpoint L-shaped wrench with width across the flats of 4mm, and remove the three COIL ASSEMBLY HOLDERs respectively.

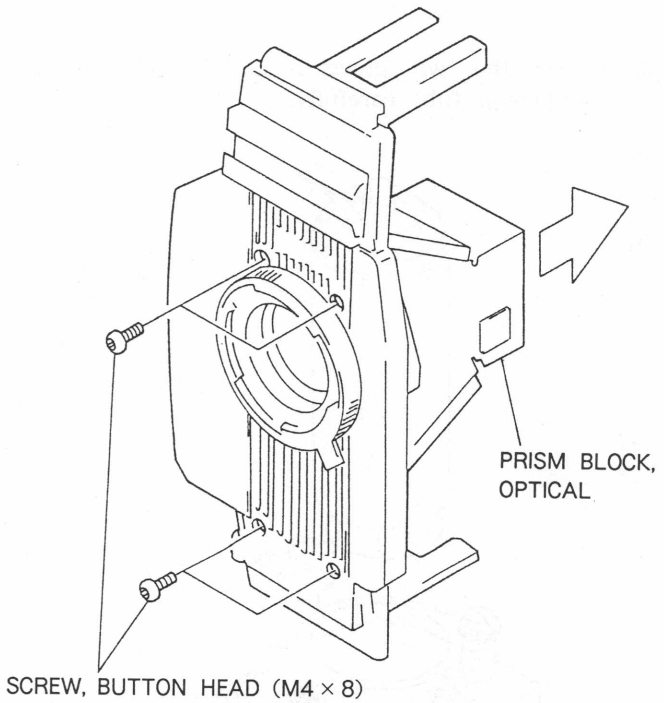


8. Disconnect the three connectors, CN15, CN16 and CN17 on the SV-107 board. Remove the two screws (+ P3 × 18) securing the BIAS LIGHT HOLDER.

Note : Take care not to bend the FIBER CABLE.



9. Remove the four BUTTON HEAD SCREWs (M4 × 8) using a ballpoint L-shaped wrench with width across the flats of 2.5mm, and remove the OPTICAL PRISM BLOCK.



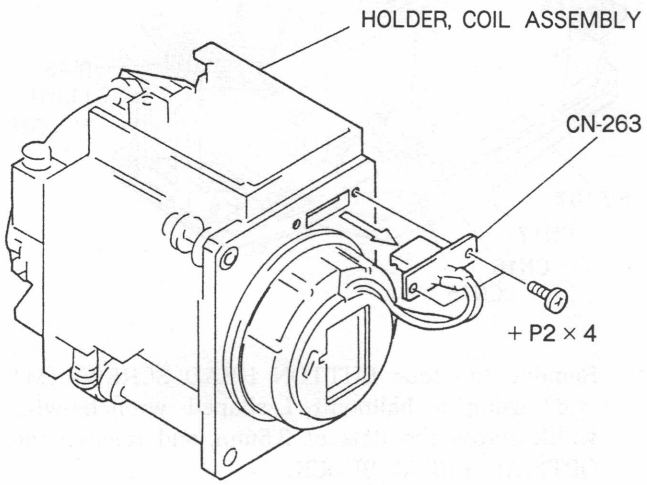
10. When installing the OPTICAL PRISM BLOCK, reverse the procedures for removal.

2-3. REPLACEMENT OF PICKUP TUBE (HDC-300)

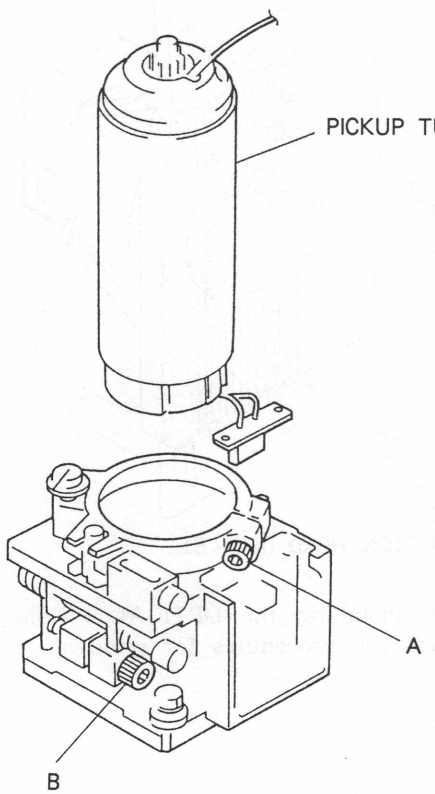
REMOVAL

1. Remove a pickup tube to be replaced, with the COIL ASSEMBLY HOLDER attached, referring to Section 2-2 "REMOVAL OF OPTICAL PRISM BLOCK", Steps 1 to 7.

2. Remove the two screws (+ P2 × 4) and extract the CN-263 board.



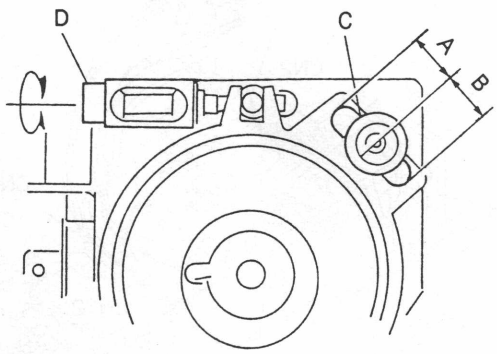
3. Loosen the two screws A and B and pull out the pickup tube carefully.



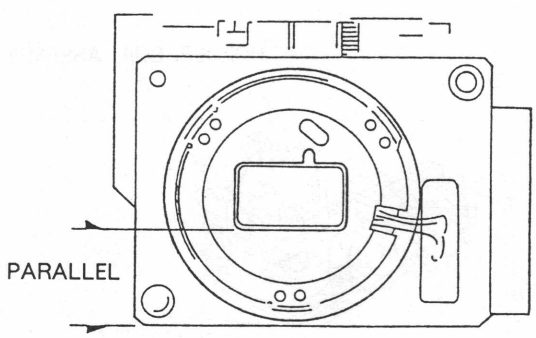
ASSEMBLY

4. Carefully insert the pickup tube into the COIL ASSEMBLY HOLDER as far as it will go, while turning it.

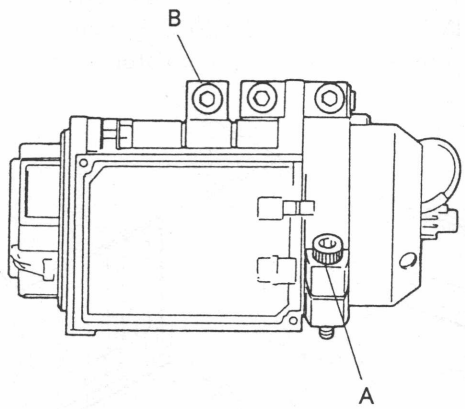
5. Adjust the rotation adjusting screw D so that the shaft fixing ring C is positioned at the center of the adjustable range. (A = B)



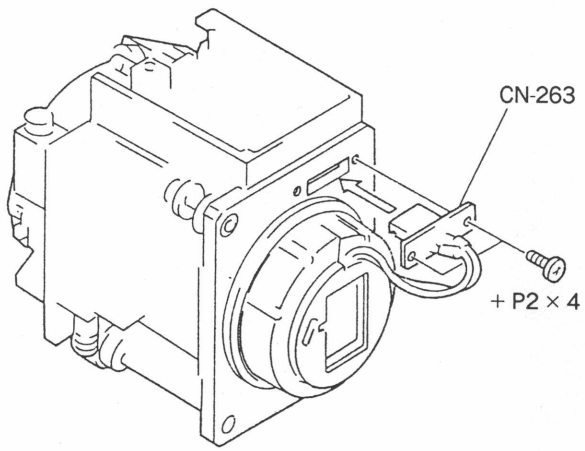
6. Turn the pickup tube so that the faceplate is parallel to the COIL ASSEMBLY HOLDER.



7. Tighten the pickup tube fixing screws in order of A to B to fix the pickup tube.



8. Fix the CN-263 board with the two screws (+ P2 × 4).



9. If necessary, clean the faceplate of a pickup tube, referring to the following step.

10. Install the COIL ASSEMBLY HOLDER to the camera, by reversing the procedures of Steps 1 to 7 in Section 2-2 "REMOVAL OF OPTICAL PRISM BLOCK".

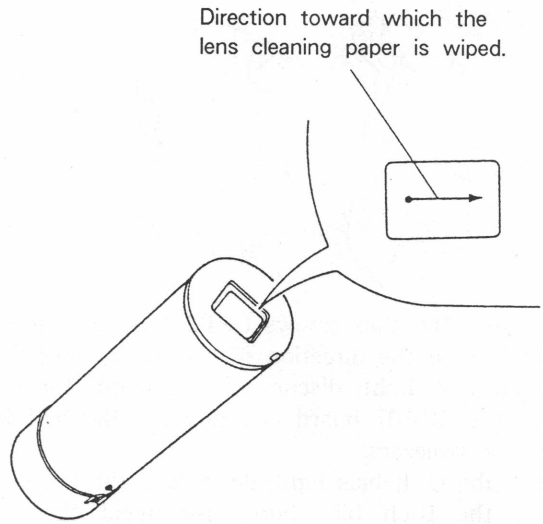
11. After replacing a pickup tube, be sure to carry out the overall adjustment for the camera.

CLEANING OF FACEPLATE

Materials required : Lens cleaning paper, ether and ethyl alcohol

(1) Prepare cleaning solution ;
Mix ether and ethyl alcohol in the ratio of 7 to 3.

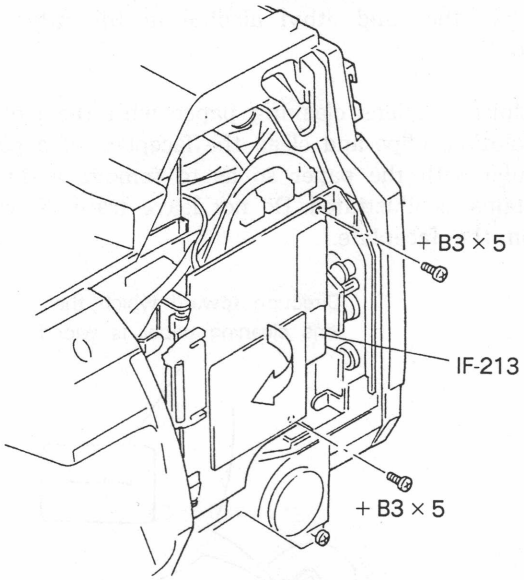
(2) Moisten a lens cleaning paper with the cleaning solution. Wipe and clean the faceplate of a pickup tube with the paper so as to remove a dust or stains as illustrated. Do not leave trace of wiping on the faceplate.



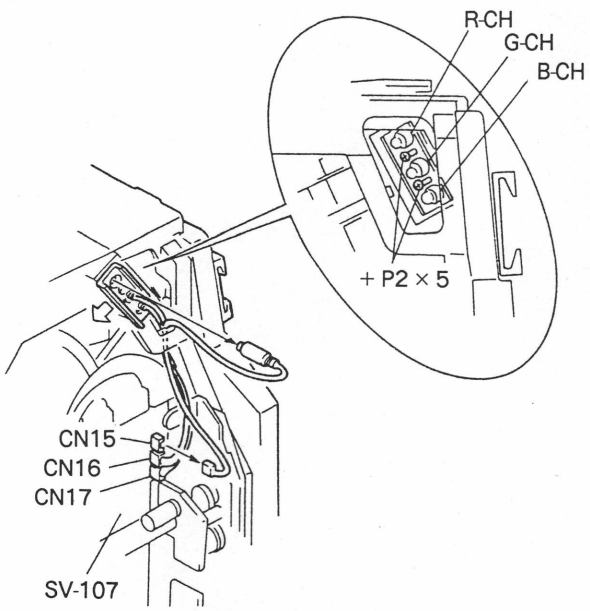
2-4. REPLACEMENT OF BIAS LIGHT (HDC-300)

1. Remove the SIDE PLATE (L) ASSY, referring to Section 2-1 "CABINET REMOVAL".

2. Remove the two screws (+ B3 × 5) and open the IF-213 board in the direction of arrow.



3. Loosen the two screws (+ P2 × 5) and slide the PLATE in the direction of arrow. To remove the R-ch bias light, disconnect the connector CN15 on the SV-107 board and pull out the bias light using tweezers.
   For the G-ch bias light, disconnect the CN16, and for the B-ch bias light, disconnect the CN17 respectively.

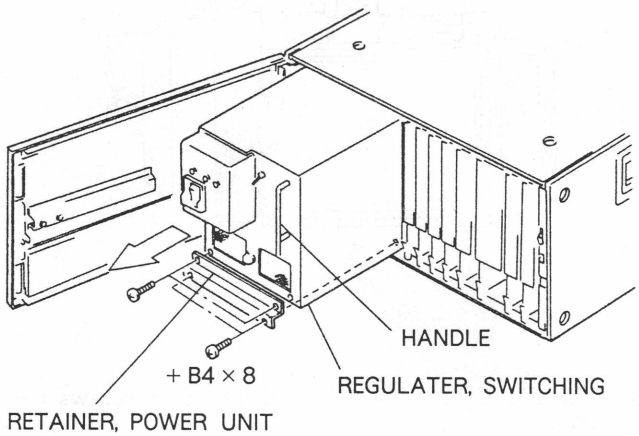


4. When a new bias light is attached, reverse the procedures for removal.

2-5. REMOVAL OF SWITCHING REGULATOR (HDCS-300)

1. Open the FRONT PANEL ASSY, referring to Section 2-1 "CABINET REMOVAL".

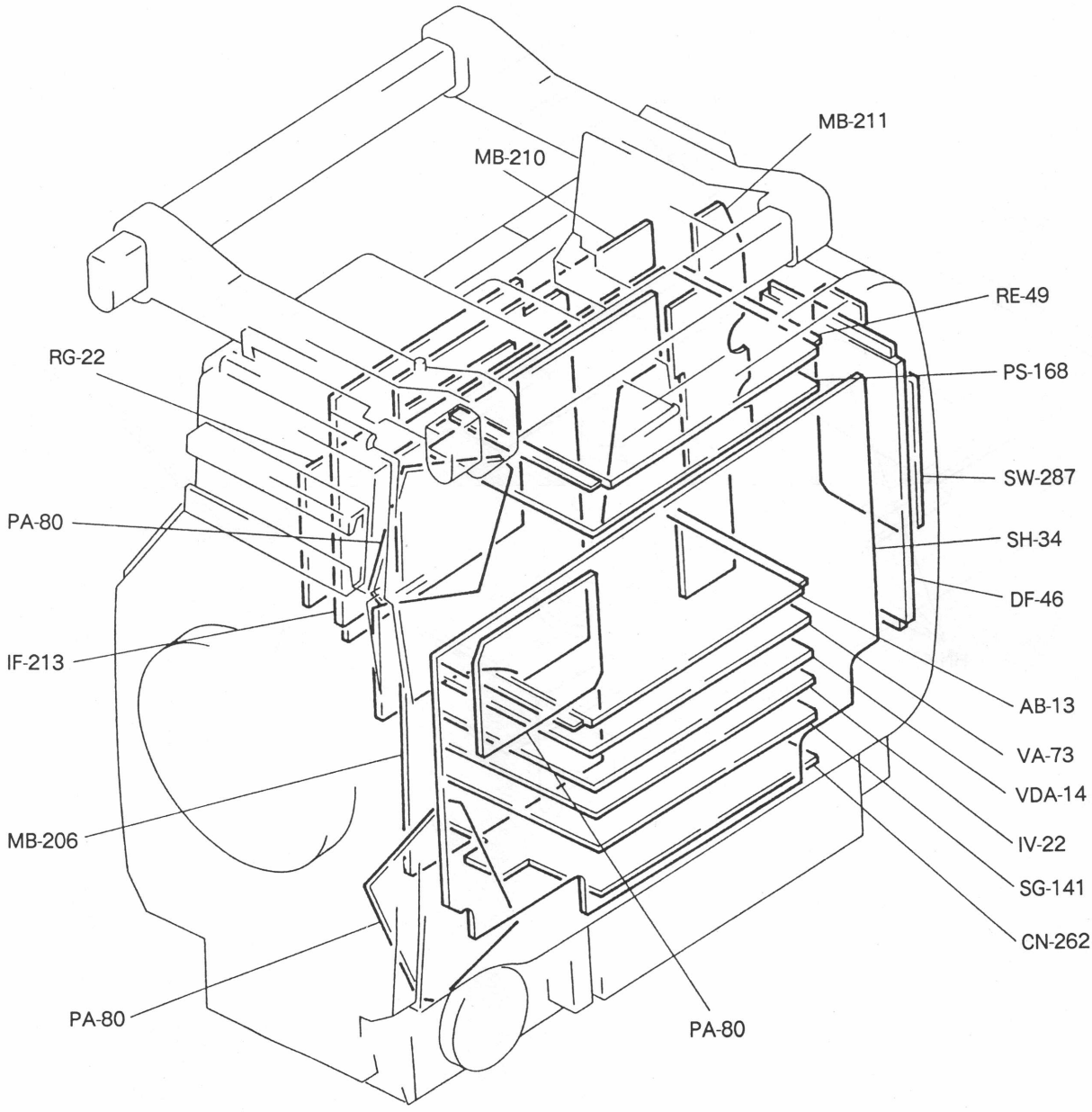
2. Remove the four screws (+ B4 × 8) and remove the POWER UNIT RETAINER. Holding the handle, pull out the switching regulator toward you.



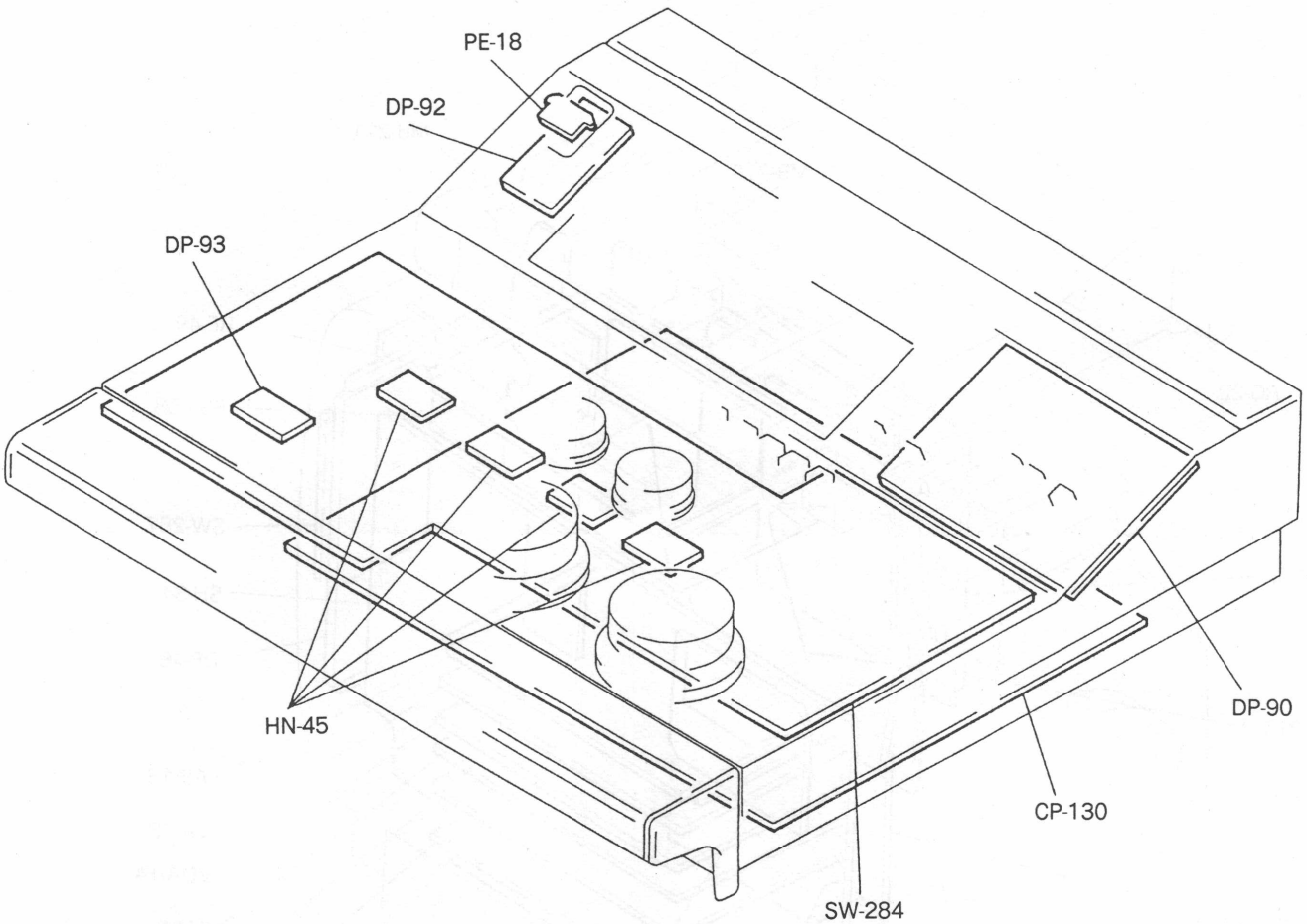
SECTION 3
SERVICE INFORMATION

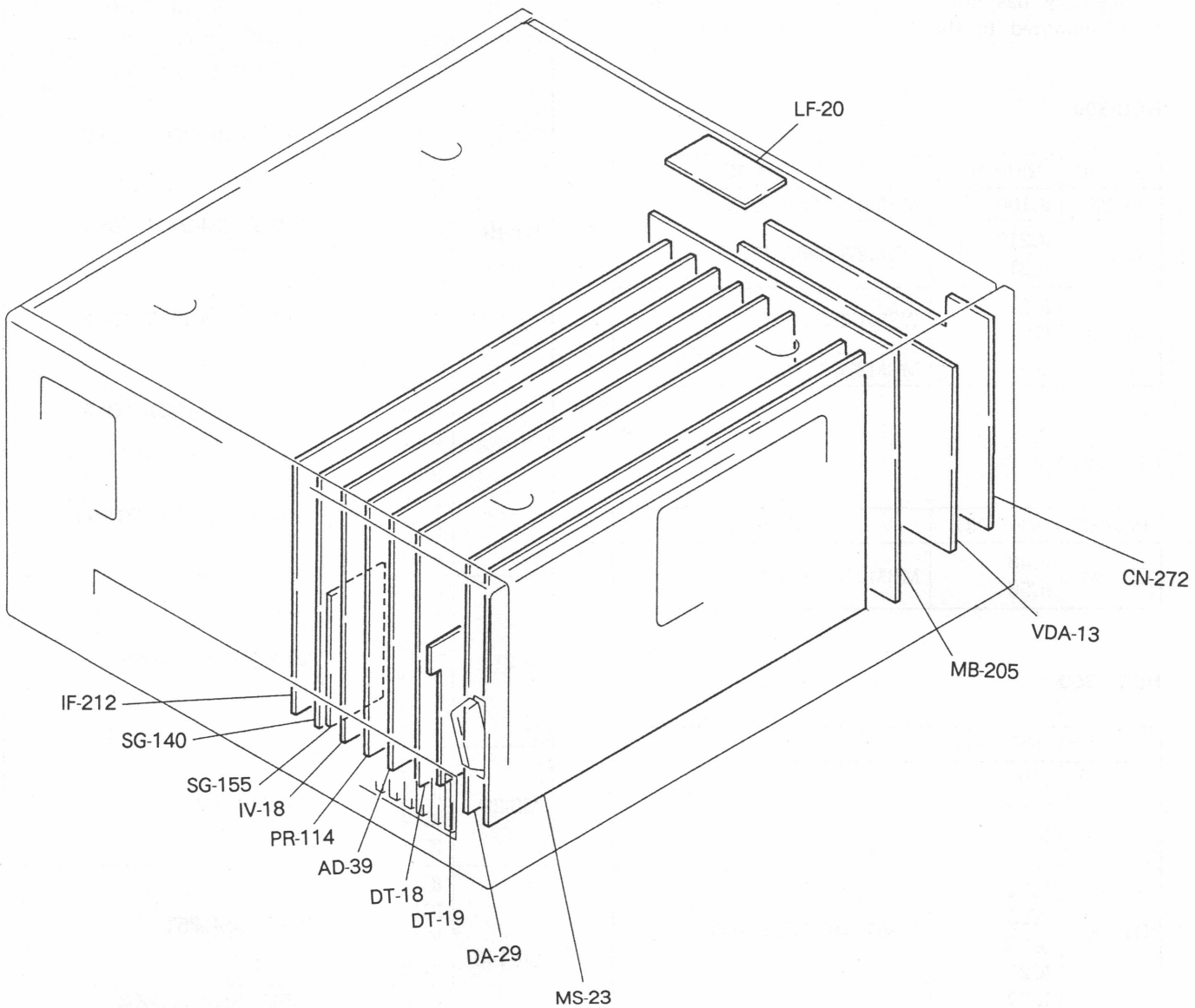
3-1. BOARD LAYOUT

HDC-300



HDCO-300




LF-20
CN-272
VDA-13
MB-205
IF-212
SG-140
SG-155
IV-18
PR-114
AD-39
DT-18
DT-19
DA-29
MS-23

3-2. NOTE ON MAINTENANCE SERVICES

3-2-1. PROM IC

Each PROM IC on the PC board has a suffix to its original designation, which is shown in bold-face type in the following table. This suffix may change according to improvement of IC. Never use an IC having no suffix to its original designation, because its memory has not been programmed. Each PROM IC is mounted to the PC board via socket.

HDC-300

BOARD	REF NO.	PROM IC
IF-123	IC106	MBM27C256A-20TV
RG-22	IC210 IC211	MBM27C256A-20TV
SG-141	IC2 IC19	WS57C49B-35T
	IC3	MBM27C64-30CV

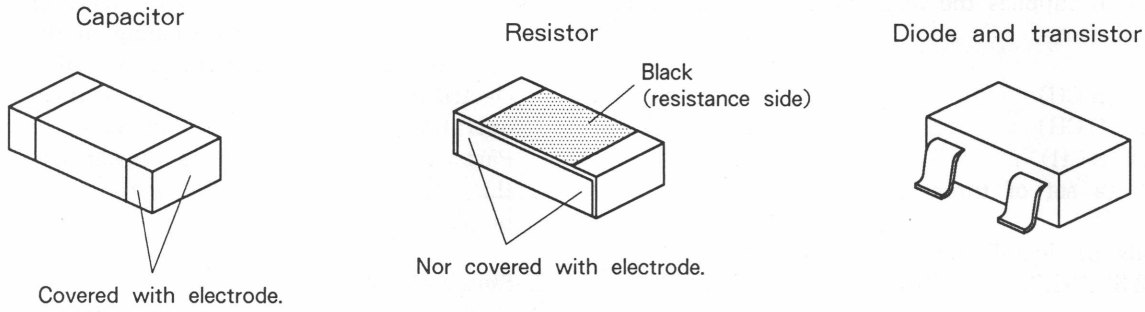
HDCO-300

BOARD	REF NO.	PROM IC
CP-130	IC48 IC56	MBM27C256A-20TV

HDCS-300

BOARD	REF NO.	PROM IC
DT-18	IC9 IC10 IC11 IC12 IC24 IC25 IC26 IC27 IC39 IC40 IC41 IC42	WS57C49B-35D/**BLG**
DT-19	IC17	MBM27C128-20TV/**DTV1**
	IC21	MBM27C128-20TV/**DTV1** (Ser. No. 10001~10120)
	IC30	WS57C49B-35D/**DHR**
	IC31	WS57C49B-35D/**DHB**
	IC32	WS57C49B-35D/**DHG**
	IC41 IC59 IC61	MBM27C64-20CV/**DL0**
	IC42 IC60 IC62	MBM27C64-20CV/**DL1**
	IC43 IC55 IC57	MBM27C64-20CV/**DL2**
	IC44 IC56 IC58	MBM27C64-20CV/**DL3**
	IC81 IC82 IC83 IC84	WS57C49B-35D/**DTEN4**
IF-212	IC31 IC32 IC33 IC34 IC35 IC36	MBM27C256A-20TV
MS-23	IC10 IC11 IC14 IC15	MCM10149L10
SG-140	IC12 IC13 IC14 IC16	WS57C49B-35T
	IC15	MBM27C256A-25CZ
	IC17	MB7114L

3-2-2. Replacement of Chip Parts



Tools required

- Soldering iron of approx. 20W (Use a temperature controller, if possible, which can control the iron temperature to 270 ± 10 ℃.)
- Desoldering metal braid (Parts No. 7-641-300-81)
- Solder (A solder of 0.6mm in diameter is recommended.)
- Tweezers

Soldering conditions

- Iron temperature of 270 ± 10 ℃
- Soldering should be performed within two seconds.

Procedures

1. To remove a resistor or capacitor, place the tip of a soldering iron on chip parts to heat the parts, and then move it horizontally for removal while being desoldered. For removal of a diode or transistor, heat the one side, with two pins, of chip parts at the same time. Set the parts up when desoldered and remove two pins. And then remove the pin on another side.
2. Absorb solder by using a desoldering metal braid to smooth the land surface after removal.
3. Confirm by visual check that no trace is come off, no adjacent parts is damaged and no bridging occur.
4. Perform a thin pretinning on the trace.
5. Place new chip parts on the trace to solder its both sides.

Note : Do not reuse parts which have been removed.

For details, see "CHIP COMPONENTS manual" (Parts No. 9-963-089-01) prepared by Sony Corporation.

3-2-3. Supply of Pickup Tube

The HDC-300 supplies the following pickup tube kits as optional parts.

RKP-300R (R-CH)
RKP-300G (G-CH)
RKP-300B (B-CH)
RKP-300X (a set of three tubes)

For details on installation of pickup tube, refer to Section 2-3 "REPLACEMENT OF PICKUP TUBE".

3-2-4. Note On Replacement Parts

1. Safety Related on Components Warning
   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony Parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

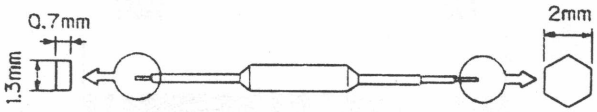
2. Standardization of Parts
   Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."
   - This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present."
   - Regarding engineering parts and diagrams changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. Stocked of Parts
   The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Order for parts marked with "O" will be proceed, but allow for additional delivery time.

4. Units of Capacitors, Inductors, and Resistors
   The following units are omitted in the schematic diagrams, exploded views, and electrical parts lists unless otherwise specified ;
   Capacitor : μF
   Inductor : μH
   Resistor : Ω

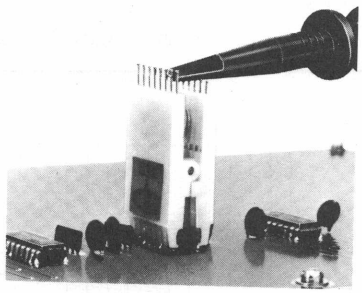
3-3. TOOLS AND FIXTURES

Adjusting Screwdriver Sony Parts No. 7-700-733-01



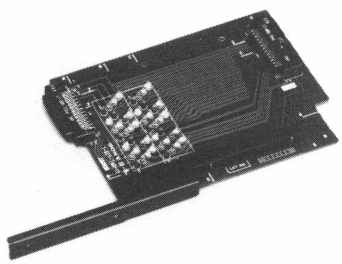
IC Test Clip

TC-16 Sony Parts No. J-6041-770-A
TC-20 Sony Parts No. J-6041-780-A



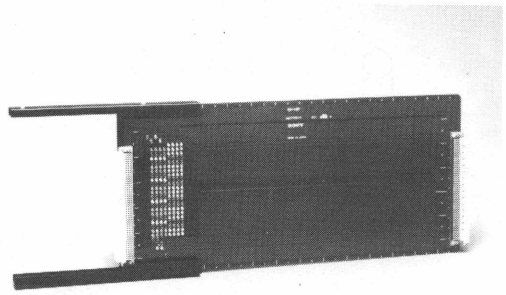
This clip is convenient for contacting an oscilloscope probe with each leg of DIP type IC when the IC is checked and adjusted. TC-16 is used for an IC having 14 or 16 pins and TC-20 is used for an IC having 18 or 20 pins.

Extension Board "EX-188"
(Supplied with the HDC-300)
Sony Parts No. A-7513-793-A



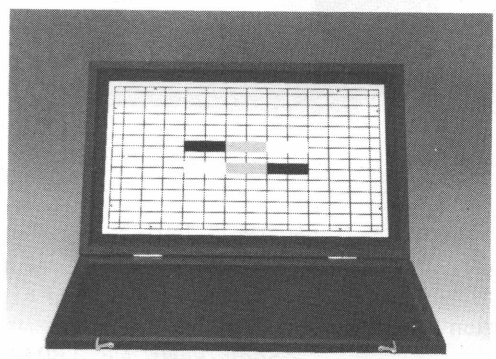
This board is used to check and repair PC boards for the camera head HDC-300, such as the RE-49, PS-168, AB-13, VA-73, VDA-14, IV-22, SG-141 and DF-46.

Extension Board "EX-187"
(Supplied with the HDCS-300)
Sony Parts No. A-7513-811-A



This board is used to check and repair PC boards for the camera signal processor HDCS-300, such as the IF-212, SG-140, IV-18, PR-114, AD-39, DT-18, DA-29 and MS-23.

Test Chart (Supplied with the HDC-300)
Sony Parts No. 3-731-746-01

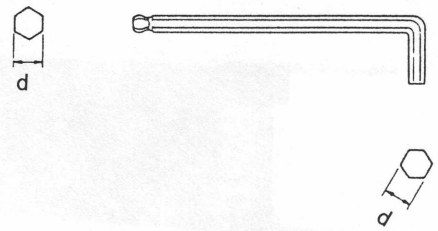


This chart is used to adjust the registration and to adjust the level of the setup file.

Ballpoint Wrench

Product of BONDHUS

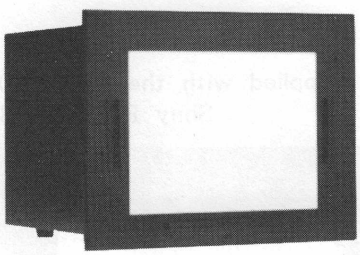
Sony Parts No. 7-721-130-53 (d = 2.5mm)
7-721-130-54 (d = 3.0mm)
7-721-130-55 (d = 4.0mm)



This wrench is used when the optical prism block or the pickup tube is replaced.

Pattern Box "PTB-500"

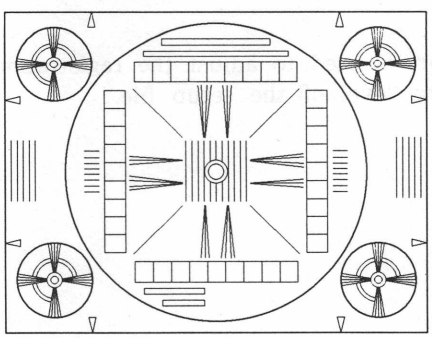
Sony Parts No. J-6029-140-A



Light source for transparent charts.

Resolution Chart

Sony Parts No. J-6026-100-A

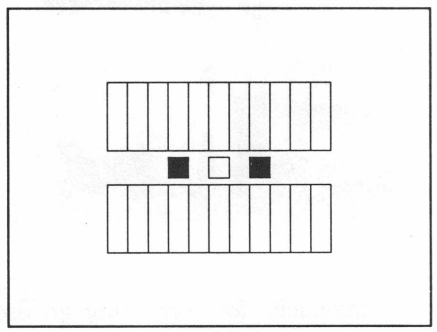


Burst Chart

Sony Parts No. J-6026-110-A

Gray Scale Chart

Sony Parts No. J-6026-130-A



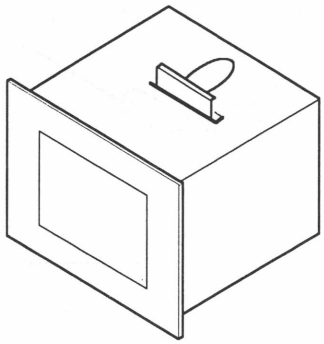
SECTION 4
ALIGNMENT

4-1. PREPARATION

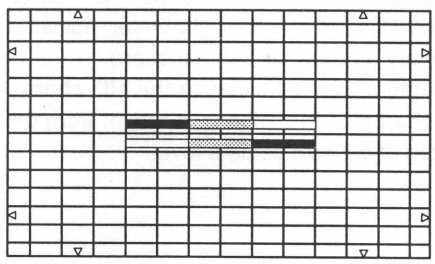
4-1-1. Equipment required

J-6029-140-A	Pattern Box PTB-500

PTB-100 is also available.

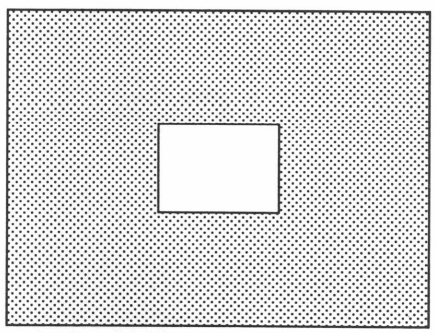


3-731-746-01	HD chart



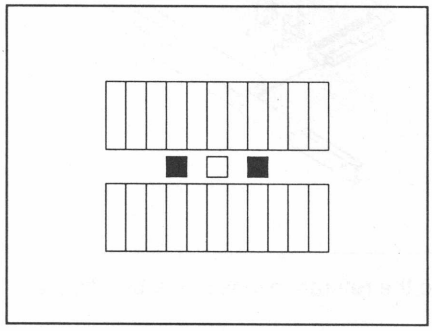
White Window Chart

Make a hole in the center of black paper as shown in the figure.

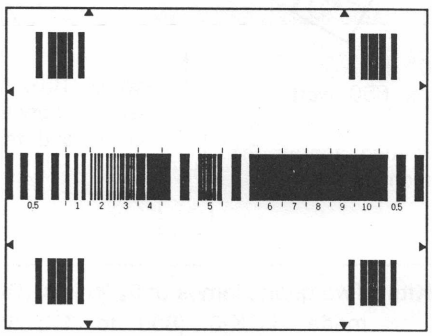


J-6026-130-B	Gray Scale Chart

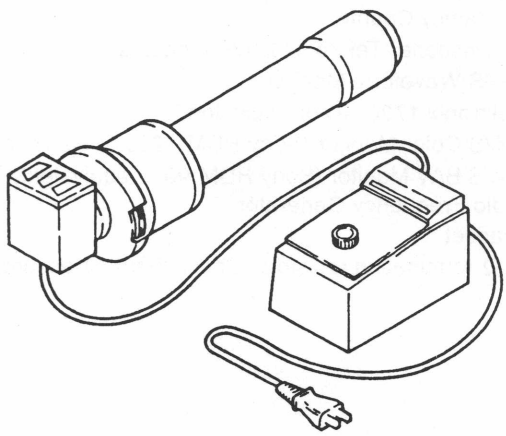
Stick the velvet (black) at the both sides of white pattern in the center to avoid the light leakage.



J-6026-110-A	Burst Chart

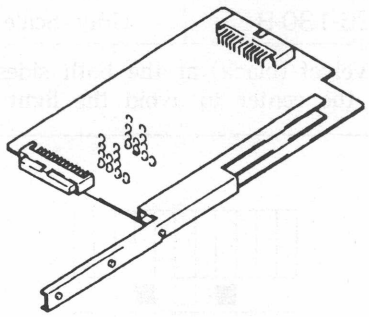


Reference Lens



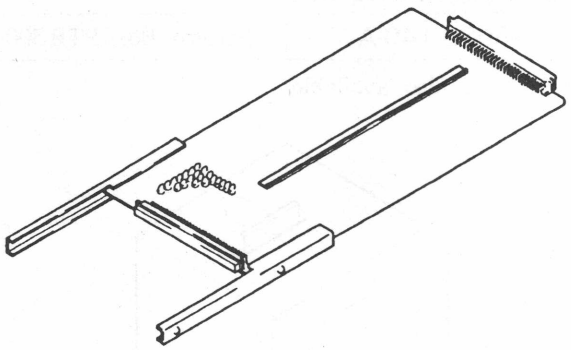
A-7513-793-A	Extension board EX-188

Supplied accessory

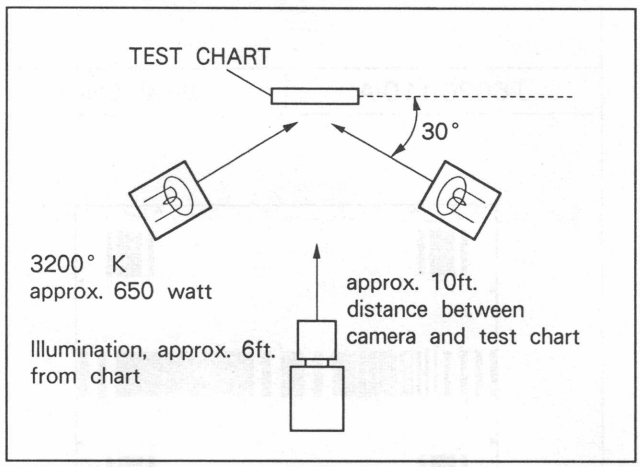


A-7513-811-A	Extension board EX-187

Supplied accessory



Note: Use the reference lens made by NIKON.



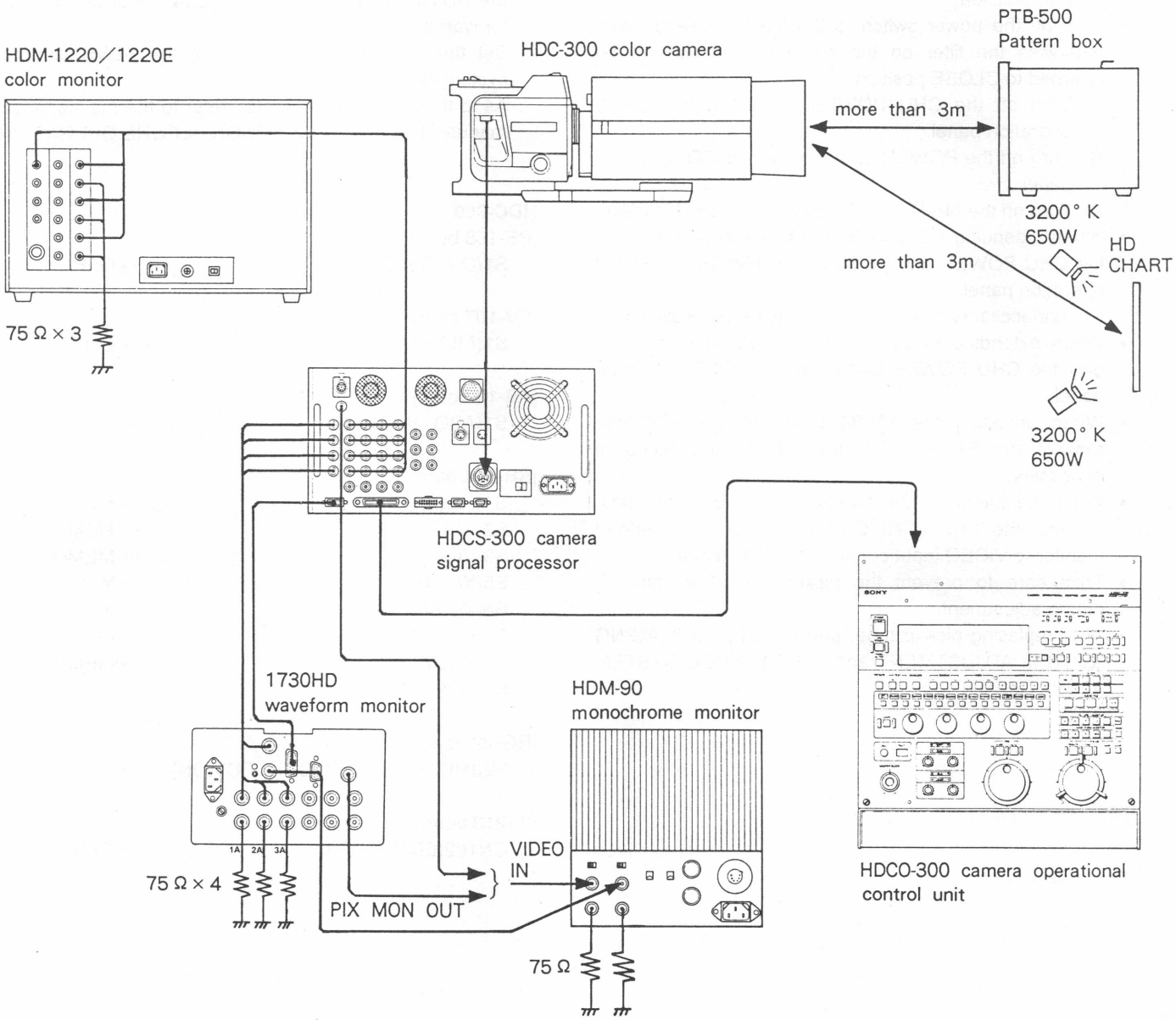
Set the distance between the camera and the test chart so that the image of the chart fills the entire picture frame with the zoom control set to mid-rotation.
Mount the Test chart on a wall or chart stand and illuminate the test chart uniformly with 3200 ° K quartz lamp for approx. 2000 lux (so that the light meter indicates the same value at every position on the test chart).
Set the camera perpendicular to the HD chart. Adjust the center of chart with that of lens in height from the floor and level the top of camera using a level.

Lighting Kits: Two quarts lamps of 3200 ° K (Ryudensha made, LQK-6 (800 to 1K) WATT or equivalent)

Measuring equipment

- Digital Voltmeter
- Frequency Counter
- Oscilloscope (Tektronix 2465 or equivalent)
- HDVS Waveform Monitor
  (Tektronix 1730 HD or equivalent)
- HDVS Color Monitor (Sony HDM-1220 or equivalent)
- HDVS B/W Monitor (Sony HDM-90 or equivalent)
- Audio Frequency Generator
- Headset
- 75 Ω terminating resistors. Check them for accuracy.

4-1-2. Connection



4-1-3. Note on Adjustment

- When replacing the lens, confirm that the filter is set to CLOSE position.
- Turn off the power switch to the following sequences, otherwise the filter on the camera head will not be returned to CLOSE position.
  ① Turn off the CHU POWER switch on the HDCO operation panel.
  ② Turn off the POWER switch on the HDCO operation panel.
  ③ Turn off the MAIN POWER switch of the HDCS-300.
- When extending PC boards of the HDCS-300, turn off the CHU POWER and POWER switches on the HDCO operation panel.
  It is unnecessary to turn off the MAIN POWER switch.
- When extending PC boards of the HDC-300, turn off only the CHU POWER switch on the HDCO operation panel.
- When adjusting the SH-34 board of the HDC-300, remove the SH COVER attached on the board, if necessary.
- When the line select function is required for adjustment, connect the PIX MONI OUT connector of waveform monitor to VIDEO input connector of B/W monitor.
- Take care to prevent the pickup tube from sticking during adjustment.
- After replacing pickup tube, perform STEP 5 IMAGING SYSTEM ADJUSTMENT and STEP 6 VIDEO SYSTEM ADJUSTMENT.

4-1-4. Initial Setting

1. Before adjustment, turn on the power for each block of the HDVS camera system and allow about 30 minutes for warming the unit up.
2. Set the switches and controls of the HDVS camera system as follows:
   As to the other switches, etc., refer to the maintenance manual "1-8. INITIAL SETTINGS BEFORE OPERATION".

HDC-300

[PS-168 board]

S1(OVERSCAN)	→ OFF

[SV-107 board]

S1(FILTER)	→ OUTO

[AB-13 board]

S1(ABO ON/OFF)	→ ON

[SH-34 board]

S1(REGI)	→ MEMO
S2(DIST)	→ MEMO
S3(VIDEO)	→ MEMO
S5(Y/ – G)	→ Y
S6(Y/NAM Y)	→ Y
S10(LENS-COMP)	→ ON
S11(LENS-F)	→ MEMO
S13(CAMERA NO)	→ 1

[RG-22 board]

S201(DIGITAL REGI CORRECTION)	→ ON

[IF-213 board]

CN102(EMULATOR)	→ CPU

HDCS-300

[IV-18 board]

S1(10M COMP)	→ OFF
S2(TEST)	→ OFF

[PR-114 board]

S100(KNEE APERTURE)	→ OFF
S200(MATRIX)	→ OFF
S201(MATRIX 1/MATRIX 2)	→ MATRIX 2
S300(REMOTE/LOCAL)	→ REMOTE

[SG-140 board]

S2(ANALOG THROUGH)	→ OFF
S8(CABLE COMP)	→ ON

[DT-19 board]

S3(G PHASE MORE 2)	→ 2
S4(R CH TEST LEVEL)	→ 0
S5(G CH TEST LEVEL)	→ 0
S6(B CH TEST LEVEL)	→ 0
S8(TEST MODE)	→ COLOR BARS
S9(DTL CURVE)	→ 0

[MS-23 board]

S5(REMOTE/LOCAL)	→ REMOTE
S11(SYNC 1)	→ ON
S12(SYNC 2)	→ ON
S13(SYNC 3)	→ ON
S14(SYNC 4)	→ ON
S15(WFM SYNC)	→ ON
S21(GBR 1/YP_BP_R 1)	→ GBR 1
S22(GBR 2/YP_BP_R 2)	→ GBR 2
S23(GBR 3/YP_BP_R 3)	→ GBR 3
S24(GBR 4/YP_BP_R 4)	→ GBR 4

HDCO-300

[CP-130 board]

S8(CPU1 NORMAL/TEST)	→ NORMAL
S10(CPU2 NORMAL/TEST)	→ NORMAL

4-2. ADJUSTMENT PROCEDURES

STEP 1. POWER SYSTEM ADJUSTMENT

↓

STEP 2. SYNC SIGNAL SYSTEM ADJUSTMENT

↓

STEP 3. AUTOMATIC SYSTEM ADJUSTMENT 1

↓

STEP 4. TEST SIGNAL SYSTEM ADJUSTMENT

↓

STEP 5. IMAGING SYSTEM ADJUSTMENT

↓

STEP 6. VIDEO SIGNAL SYSTEM ADJUSTMENT

↓

STEP 7. AUTOMATIC SYSTEM ADJUSTMENT 2

↓

STEP 8. INCOM SYSTEM ADJUSTMENT

4-3. ADJUSTMENT ITEMS

STEP 1. POWER SYSTEM ADJUSTMENT
1-1. HDCS-300 Power Supply Voltage Adjustment (HDCS)
1-2. HDC-300 Power Supply Voltage Adjustment (HDC)
1-3. HDCO-300 Power Supply Voltage Adjustment (HDCO)

STEP 2. SYNC SIGNAL SYSTEM ADJUSTMENT
2-1. VCO Frequency Adjustment (HDCS)
2-2. Genlock Phase Adjustment (HDCS)
2-3. Sync Signal Level Adjustment (HDCS)
2-4. System-Sync Signal Level Adjustment (HDCS)
2-5. A/D converter Read-Timing Pulse Width Adjustment (HDCO)
2-6. Rotary Encoder Pulse Check (HDCO)

STEP 3. AUTOMATIC SYSTEM ADJUSTMENT 1
3-1. CC Filter Servo Adjustment (HDC)
3-2. ND Filter Servo Adjustment (HDC)

STEP 4. TEST SIGNAL SYSTEM ADJUSTMENT
4-1. Test Signal Level Adjustment 1 (HDC)
4-2. Test Signal Level Adjustment 2 (HDC)
4-3. R-ch/G-ch/B-ch Gain Adjustment (HDCS)
4-4. R-ch/B-ch Phase Adjustment (HDCS)
4-5. Color Bar Level Adjustment (HDCS)
4-6. Y/PR/PB Balance and Gain Adjustment (HDCS)
4-7. R-G/B-G Balance Adjustment (HDCS)
4-8. Peaking Adjustment (HDCS)
4-9. Test Signal Level Adjustment 3 (HDCS)
4-10. Video Level/Pedestal Level Adjustment (HDCS)

STEP 5. IMAGING SYSTEM ADJUSTMENT
5-1. H Deflection Balance Adjustment (HDC)
5-2. V Deflection Balance Adjustment (HDC)
5-3. Beam Pre-Adjustment (HDC)
5-4. E Focus Pre-Adjustment (HDC)
5-5. G-ch Focal Distance and Rotation Adjustment (HDC)
5-6. R-ch/B-ch Focal Distance and Rotation Adjustment (HDC)
5-7. G-ch Centering Adjustment (HDC)
5-8. Picture Frame Adjustment (HDC)
5-9. Quadrature Adjustment (HDC)
5-10. BEAM/ABO Adjustment (HDC)
5-11. E Focus Adjustment (HDC)
5-12. Dynamic Focus Adjustment (HDC)
5-13. Distortion Gain Adjustment (HDC)
5-14. R-ch/B-ch Registration Adjustment (HDC)
5-15. Horizontal Pulse Timing Adjustment (HDC)

STEP 6. VIDEO SIGNAL SYSTEM ADJUSTMENT
6-1. Video Signal Input Check (HDC)
6-2. Video Signal Level Adjustment (HDC)
6-3. VDA-14 Board Input Check (HDC)
6-4. Flare Adjustment (HDC)
6-5. VDA-14 Board Output Level Adjustment (HDC)
6-6. Test Black Adjustment (HDC)
6-7. Bias Light Adjustment (HDC)
6-8. Black Level Adjustment (HDC)
6-9. Black Shading Adjustment (HDC)
6-10. Video Input Gain Adjustment (HDC)
6-11. White Shading Adjustment (HDC)
6-12. White Shading Adjustment With Distortion (HDC)
6-13. PA Offset Adjustment (HDC)
6-14. PA Low Frequency Response Adjustment (HDC)
6-15. PA High Frequency Response Adjustment (HDC)
6-16. VF Video Gain Adjustment (HDC)
6-17. Overshoot Clip Adjustment (HDCS)
6-18. Reference Voltage Adjustment (HDCS)
6-19. Video Amplifier Gain Adjustment (HDCS)
6-20. Gamma Balance Adjustment (HDCS)
6-21. Gamma Adjustment (HDCS)
6-22. Knee Slope Adjustment (HDCS)
6-23. White Clip Adjustment (HDCS)
6-24. Aperture Adjustment (HDCS)
6-25. Auto Knee Peak Adjustment (HDCS)
6-26. A/D Convertor Reference Voltage Adjustment (HDCS)
6-27. A/D Convertor Black Adjustment (HDCS)
6-28. A/D Convertor White Adjustment (HDCS)

STEP 7. AUTOMATIC SYSTEM ADJUSTMENT 2
7-1. Auto System G Gain and R-G/B-G Balance Adjustment (HDCS)
7-2. Temperature Sensor Adjustment (HDC)
7-3. Auto Iris Adjustment (HDC)

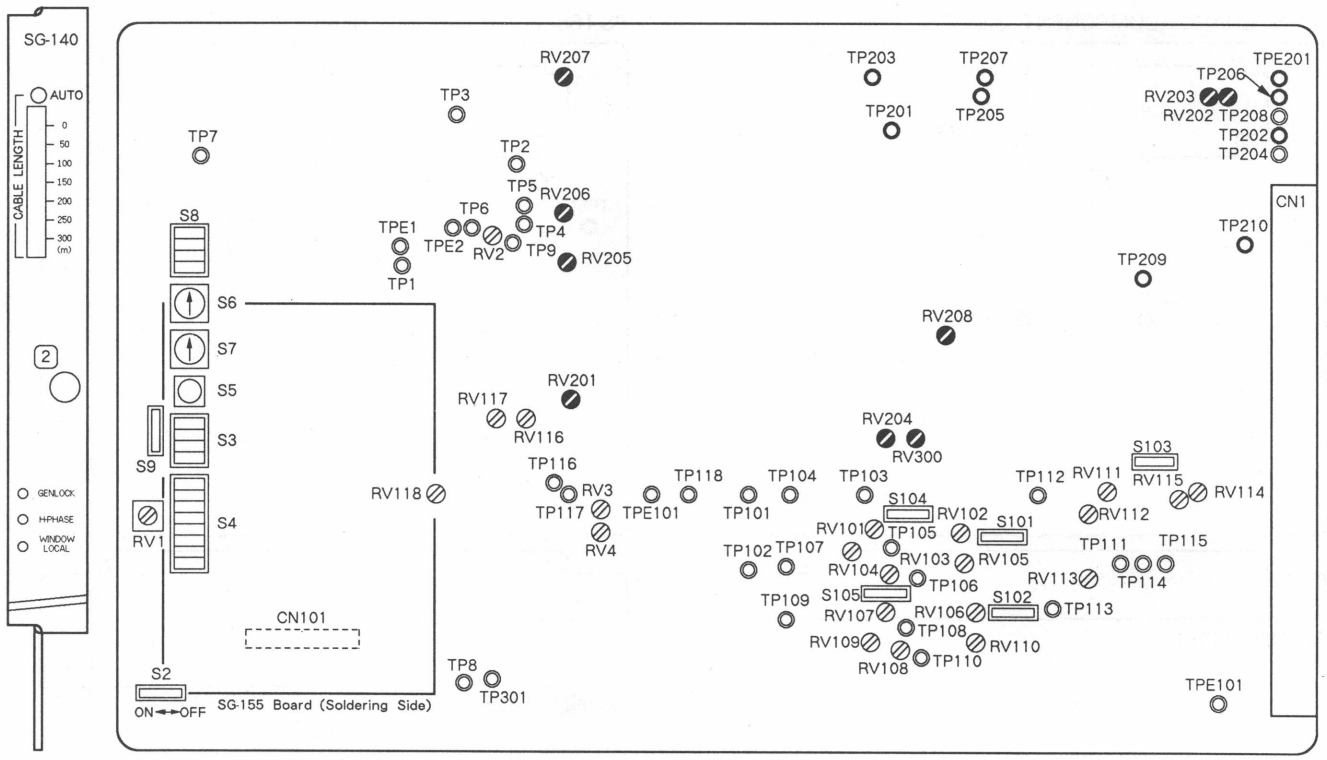
STEP 8. INCOM SYSTEM ADJUSTMENT
8-1. Incom Sample Pulse Phase Adjustment (HDCS)
8-2. Incom Adjustment

STEP 1. POWER SYSTEM ADJUSTMENT

1-1. HDCS-300 POWER SUPPLY VOLTAGE ADJUSTMENT (HDCS)

Note: If this adjustment is performed, be sure to check all of adjustment items related to the HDCS-300.

Equipment: Digital voltmeter
To be extended: SG-140 board



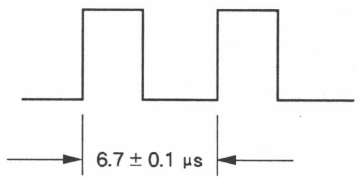
(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

Adjustment procedures

1.

Item	Test point (SG-140)	Adjusting point (SG-140)	Specification
+9V adj.	TP201 (GND; E201) TP203 (GND; E201) TP202 (GND; E201)	◐ RV201 (+9V CONT 1) ◐ RV205 (–9V CONT) ◐ RV202 (+9V CONT 2)	+10.0 ± 0.01 Vdc –10.0 ± 0.01 Vdc +9.0 ± 0.01 Vdc
+5V adj.	TP205 (GND; E201) TP207 (GND; E201) TP206 (GND; E201)	◐ RV206 (+5V CONT 1) ◐ RV207 (–5V CONT) ◐ RV203 (+5V CONT 2)	+6.0 ± 0.01 Vdc –6.0 ± 0.01 Vdc +5.0 ± 0.01 Vdc
–2V adj.	TP209 (GND; E201) TP210 (GND; E201)	◐ RV204 (–2V CONT 1) ◐ RV208 (–2V CONT 2)	–3.0 ± 0.01 Vdc –2.0 ± 0.01 Vdc

2. Adjust ◐ RV300 (– 2V FREQ ADJ)/SG-140 board so that the period of pulse waveform at anode terminal of D219 is 6.7 ± 0.1 µs. (Serial No. 10101 and higher)

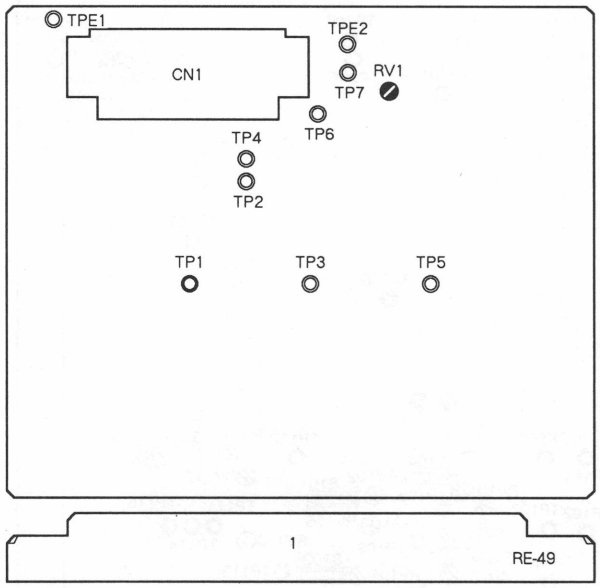


1-2. HDC-300 POWER SUPPLY VOLTAGE ADJUSTMENT (HDC)

Note: If this adjustment is performed, be sure to check all of adjustment items related to the HDC-300.

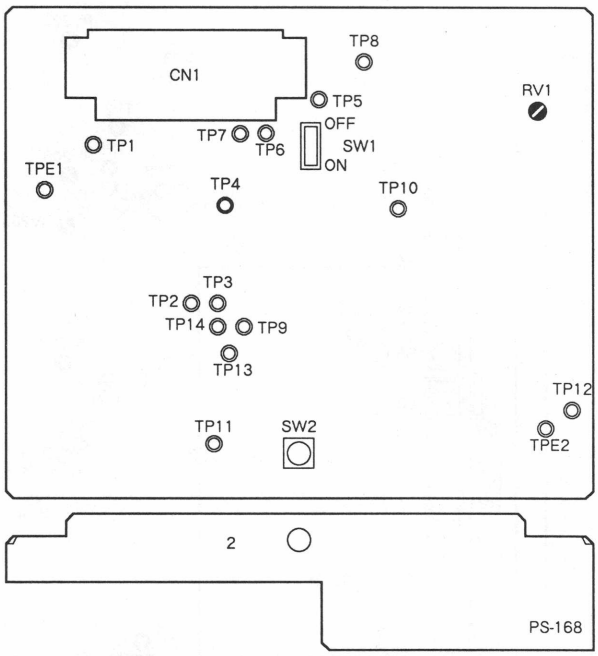
Equipment: Digital voltmeter
To be extended: RE-49 board, PS-168 board

RE-49 BOARD (COMPONENT SIDE)



(PANEL SIDE)

PS-168 BOARD (COMPONENT SIDE)



(PANEL SIDE)

Adjustment procedures

1. +9.5V adjustment

Test point	Adjusting point	Specification
TP1 (GND; E1)	RV1 (+9.5V SET)	+9.5 ± 0.01Vdc

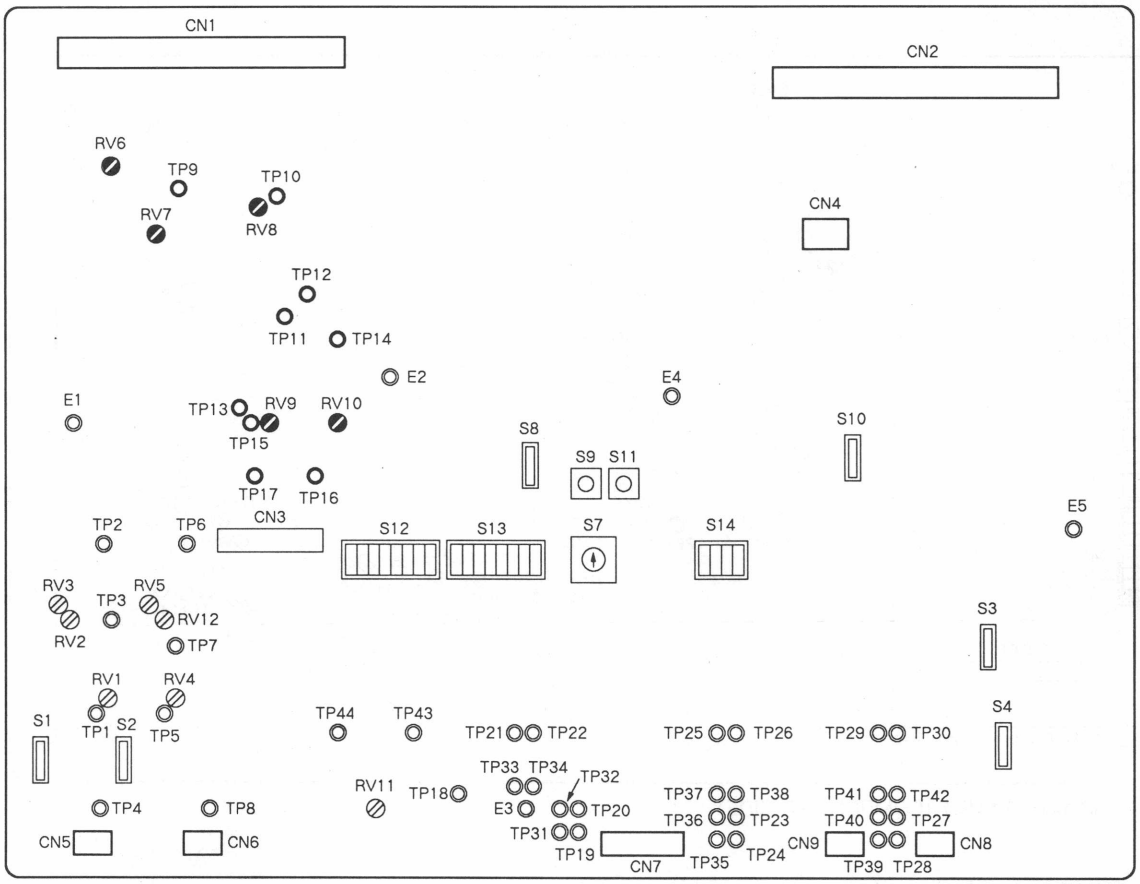
2. –VT SET adjustment

Test point	Adjusting point	Specification
TP4 (GND; E2)	RV1 (–VT SET)	–75.0 ± 0.2Vdc

1-3. HDCO-300 POWER SUPPLY VOLTAGE ADJUSTMENT (HDCO)

Note: If this adjustment is performed, be sure to check all of adjustment items related to the HDCO-300.

Equipment: Digital voltmeter



CP-130 BOARD (COMPONENT SIDE)

Adjustment procedures

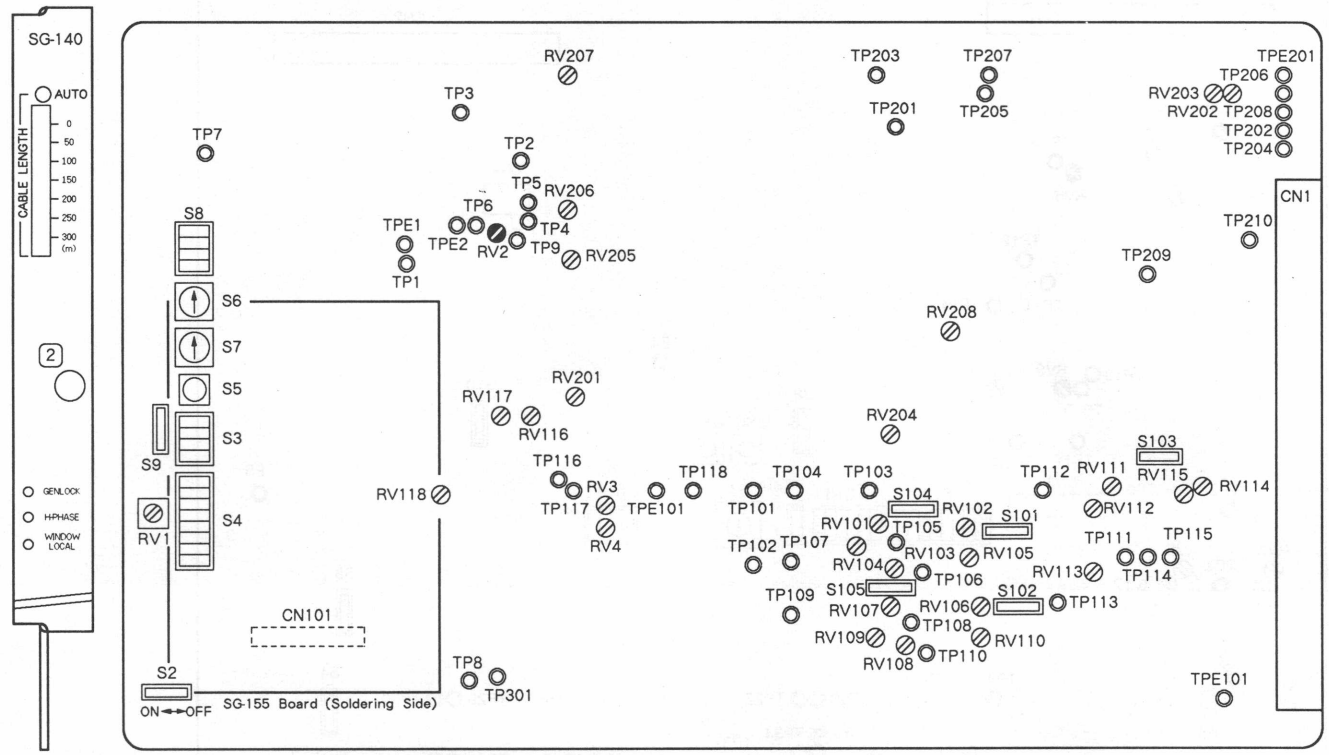
Item	Test point (CP-130)	Adjusting point (CP-130)	Specification
+15V adj.	TP16 (GND; E1) TP15 (GND; E1)	RV10 (+15V ADJ) Checking	+15 ± 0.8 Vdc +17 to +20 Vdc
+9V adj.	TP9 (GND; E1) TP11 (GND; E1) TP10 (GND; E1) TP12 (GND; E1)	RV7 (+9.5V ADJ) RV6 (–9.5V ADJ) RV8 (+9V ADJ) Checking	+9.5 ± 0.05 Vdc –9.5 ± 0.05 Vdc +9 ± 0.05 Vdc –9 ± 0.05 Vdc
+7V adj.	TP17 (GND; E1)	Checking	+7V ± 0.3 Vdc
+5V adj.	TP14 (GND; E1) TP13 (GND; E1)	RV9 (+5V ADJ) Checking	+5 ± 0.02 Vdc +5.5 ± 0.05 Vdc

STEP 2. SYNC SIGNAL SYSTEM ADJUSTMENT

2-1. VCO FREQUENCY ADJUSTMENT (HDCS)

Note: Open GENLOCK IN connector on the HDCS rear panel.

Equipment: Frequency counter
To be extended: SG-140 board



(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

Test point: TP37D/extension board
Adjusting point: ◐ RV2 (FRQ ADJ)/SG-140 board
Specification: 74250.0 ± 0.1kHz

2-2. GENLOCK PHASE ADJUSTMENT (HDCS)

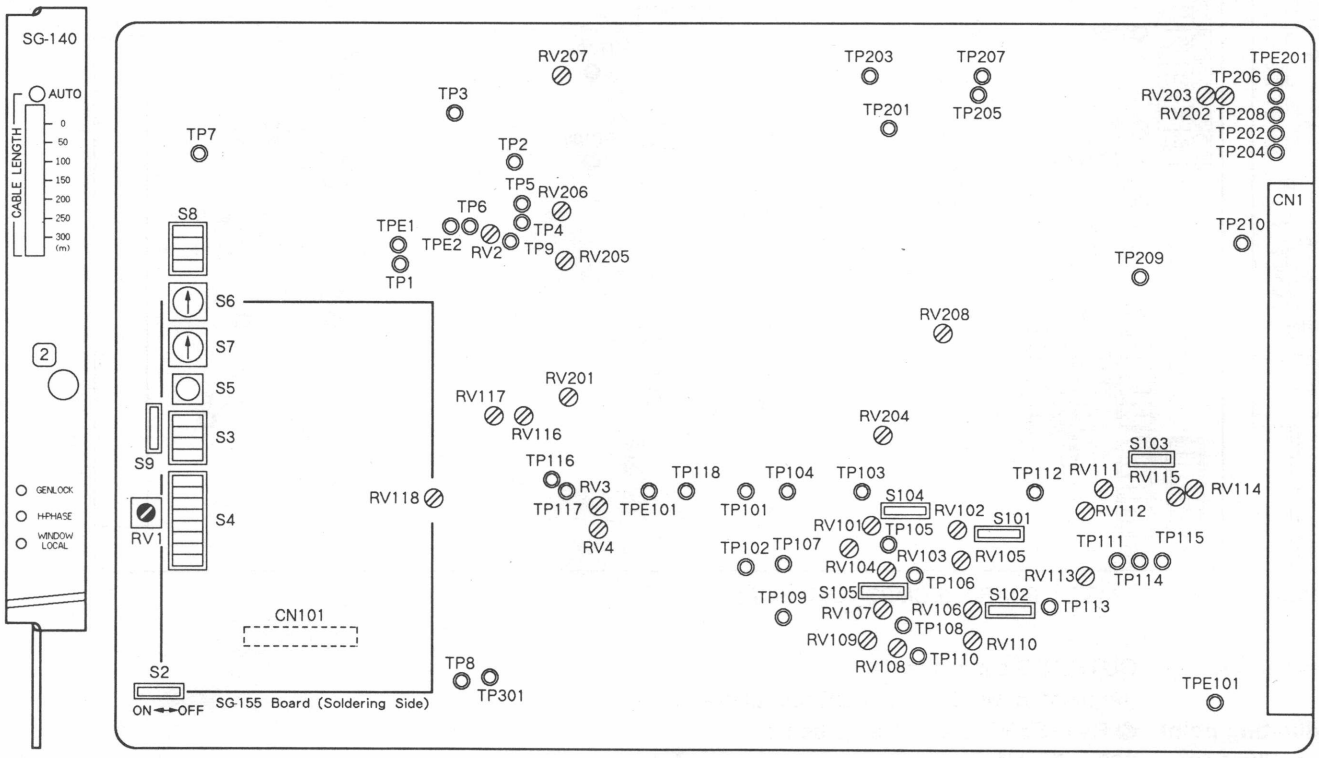
Note: COAX used must be equal length and cable type.

Equipment: Oscilloscope
(providing dual-trace mode.)

Preparation

- Prepare the HDVS system, which can supply the same tri-state sync signal as the HDC-300 series supplies, to perform the genlock adjustment.

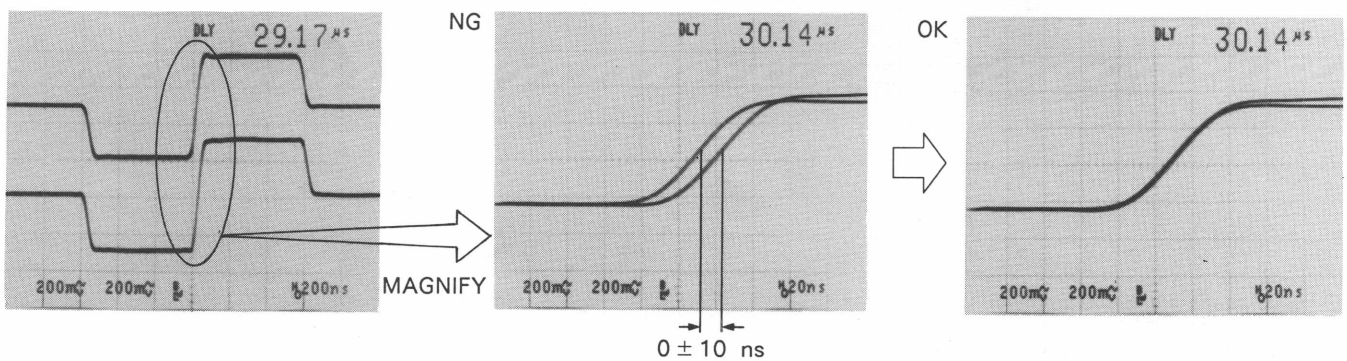
To be extended: SG-140 board



(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

Adjustment procedures

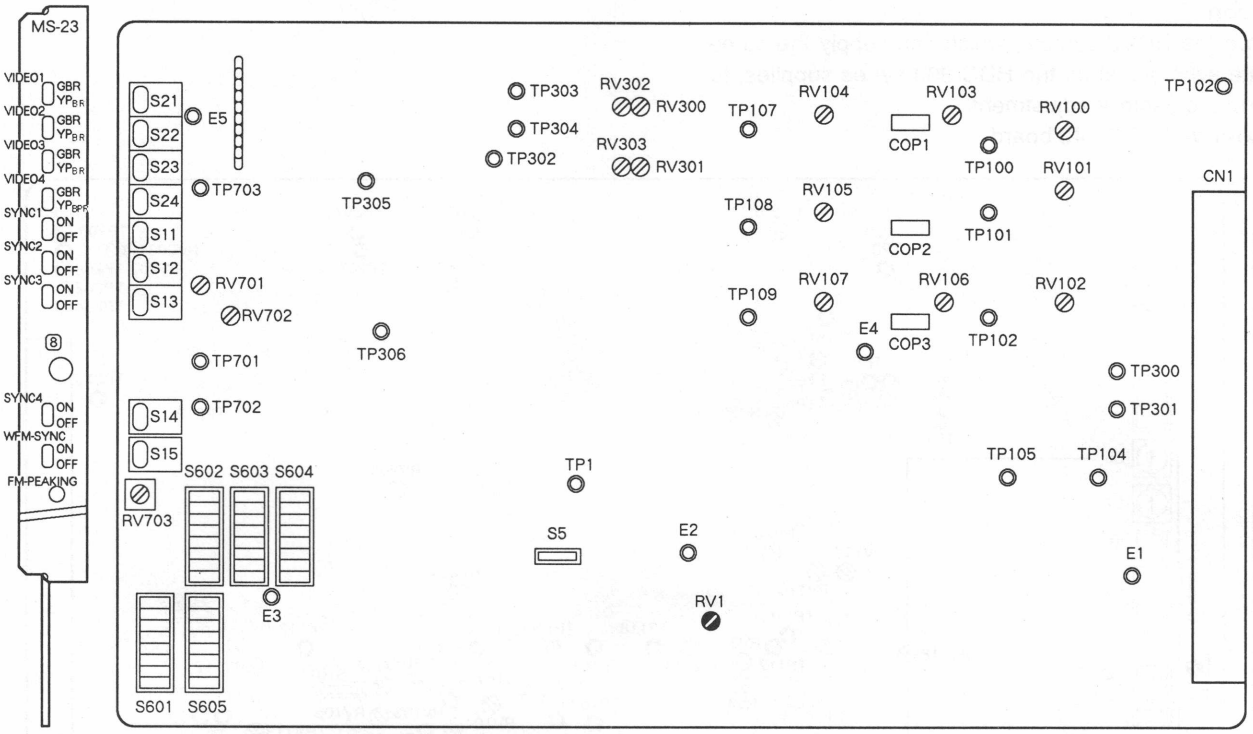
1. Feed the tri-state sync signal to the one of GENLOCK IN connectors of the HDCS rear panel and connect the other connector to CH-1 (terminated with 75 Ω) of the oscilloscope.
2. Connect any OUTPUT S connector of the HDCS rear panel to CH-2 (terminated with 75 Ω) of the oscilloscope.
3. Adjust ⊘ RV1 (H PHASE ADJ) on the SG-140 board so that the phase difference is 0 ± 10 ns.



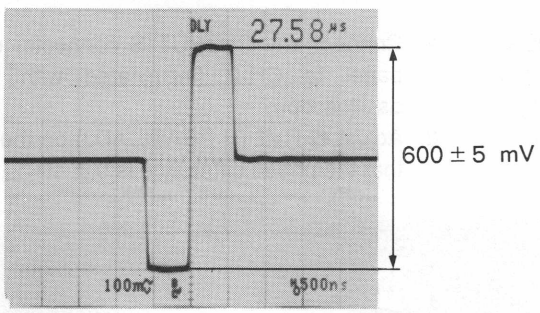
Note: After this adjustment is completed, disconnect the GENLOCK IN connectors.

2-3. SYNC SIGNAL LEVEL ADJUSTMENT (HDCS)

Equipment: Oscilloscope
To be extended: MS-23 board
Trigger: TP104/MS-23 board

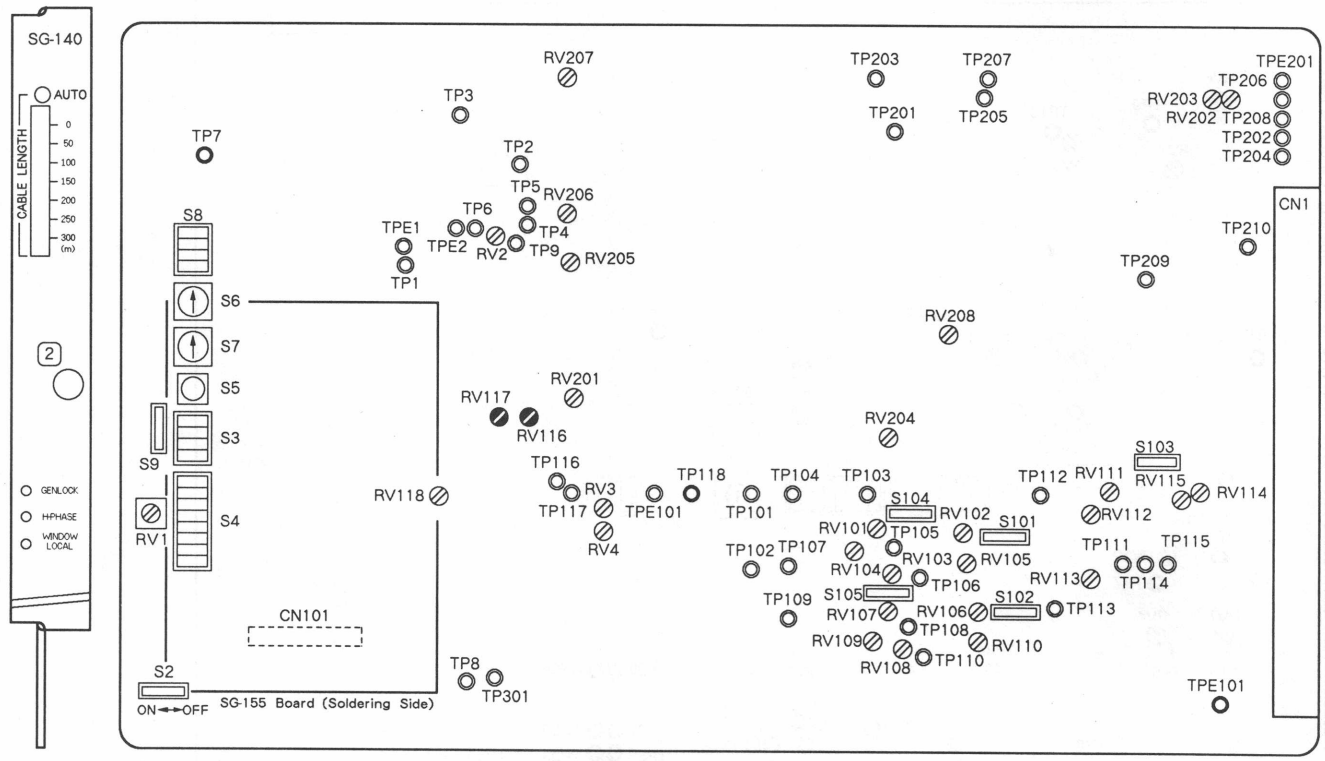


Test point: OUTPUT S connector
(terminated with 75 Ω)/HDCS rear panel
Adjusting point: ◐ RV1 (SYNC GAIN)/MS-23 board
Specification: 600 ± 5 mVp-p



2-4. SYSTEM-SYNC SIGNAL LEVEL ADJUSTMENT (HDCS)

Equipment: Oscilloscope (DC mode)
To be extended: SG-140 board
Trigger: TP7/SG-140 board

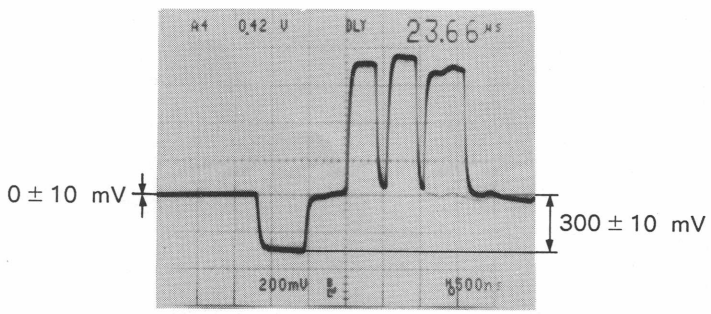


(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

Test point: TP118 (GND; E101)/SG-140 board

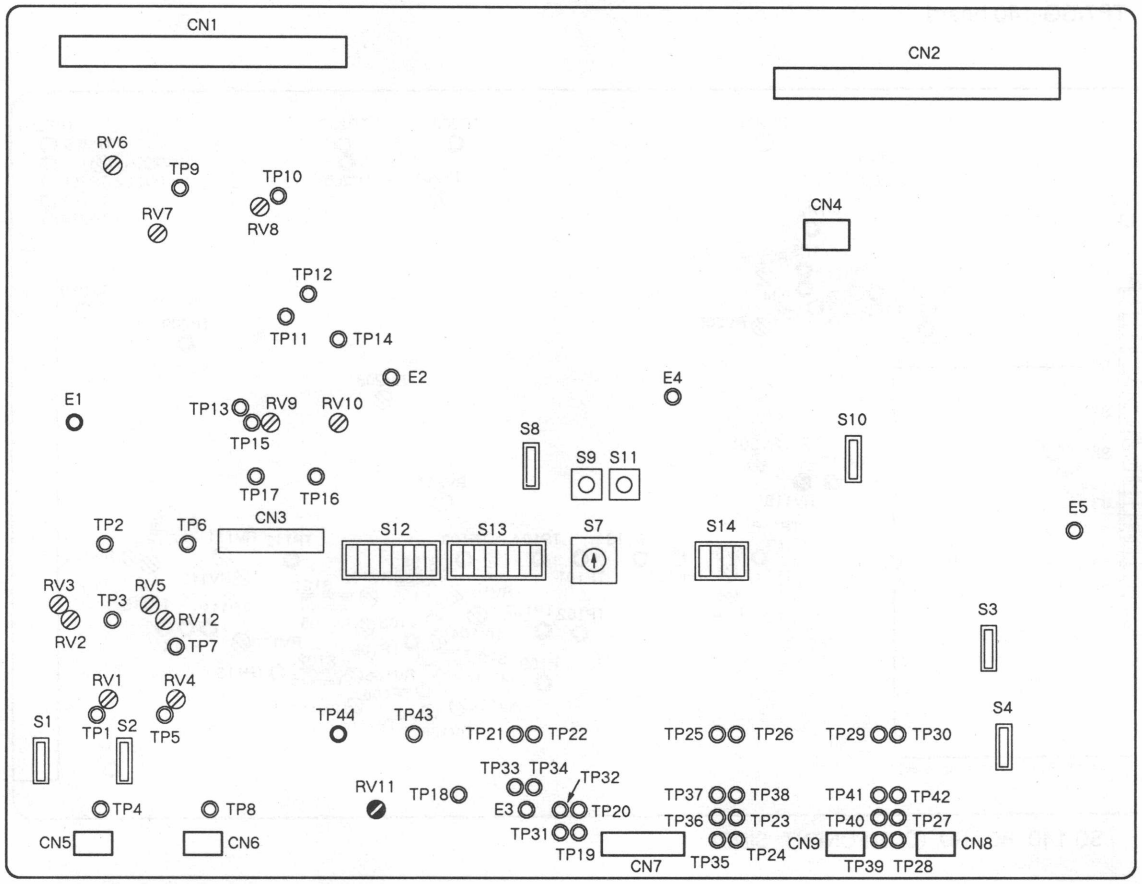
Adjustment procedures

1. Adjust ⊘ RV116 (COMMON DC)/SG-140 board so that GND level is 0 ± 10 mV.
2. Adjust ⊘ RV117 (CCU SYNC LEVEL)/SG-140 board so that SYNC level is 300 ± 10 mV.



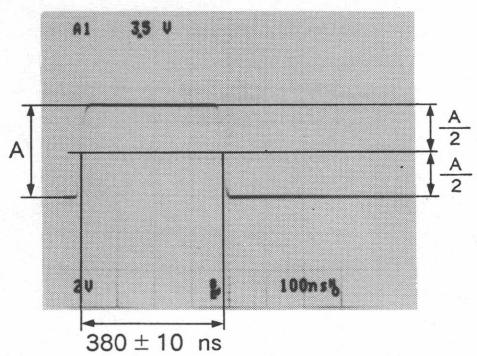
2-5. A/D CONVERTER READ-TIMING PULSE WIDTH ADJUSTMENT (HDCO)

Equipment: Oscilloscope



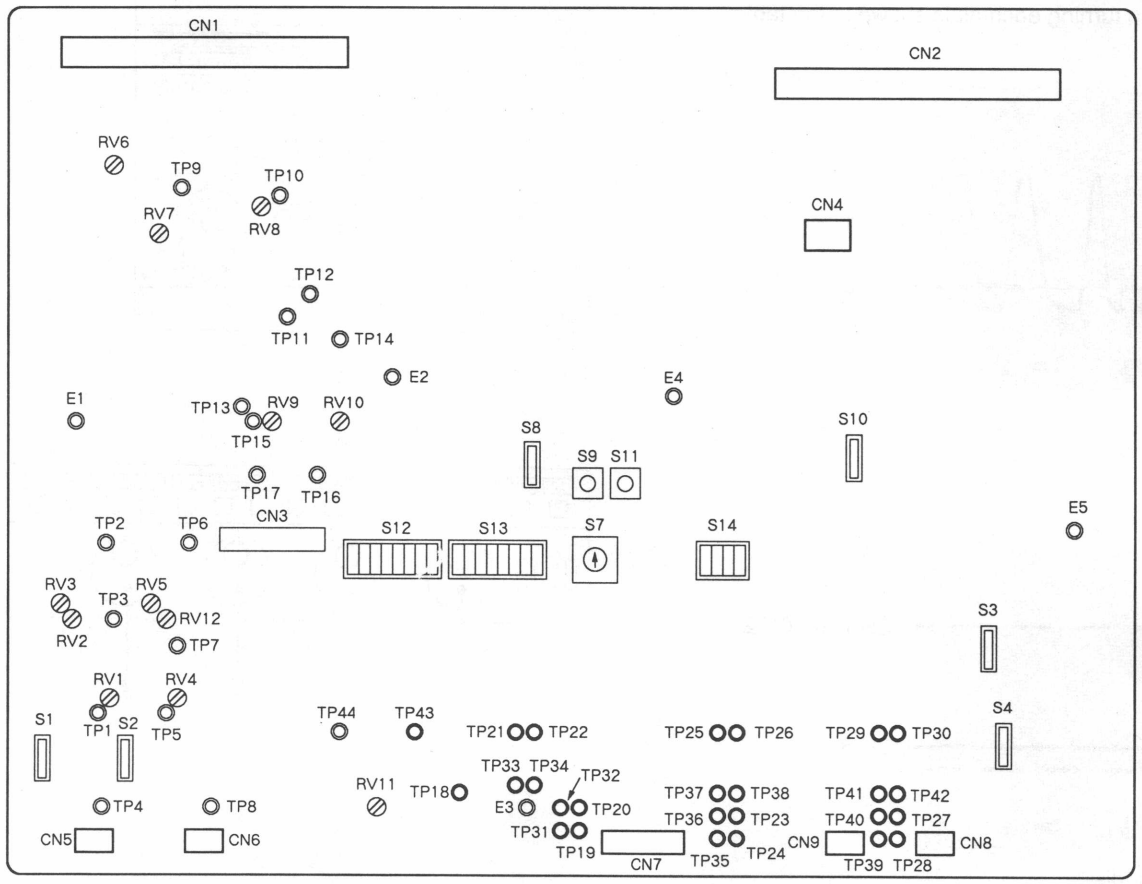
CP-130 BOARD (COMPONENT SIDE)

Test point: TP44 (GND; E1)/CP-130 board
Adjusting point: ⊘ RV11 (EN PULSE WIDTH)
/CP-130 board
Specification: 380 ± 10 ns



2-6. ROTARY ENCODER PULSE CHECK (HDCO) (1/3)

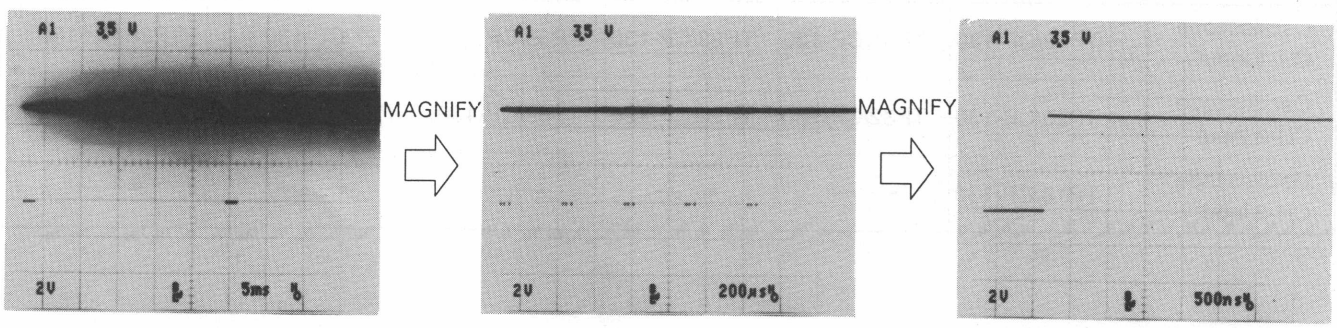
Equipment: Oscilloscope



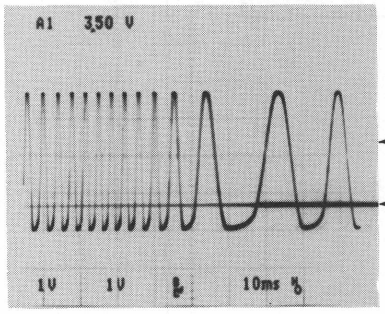
CP-130 BOARD (COMPONENT SIDE)

Checking procedures

1. Confirm that the following waveform is output at TP43 (GND; E1)/CP-130 board.



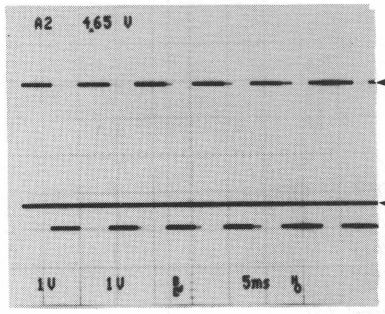
2. Checking of dial operation 1
   Confirm that the following waveforms are output at each test points when turning each dials shown in the table.



← CH-1 or CH-2

← CH-3

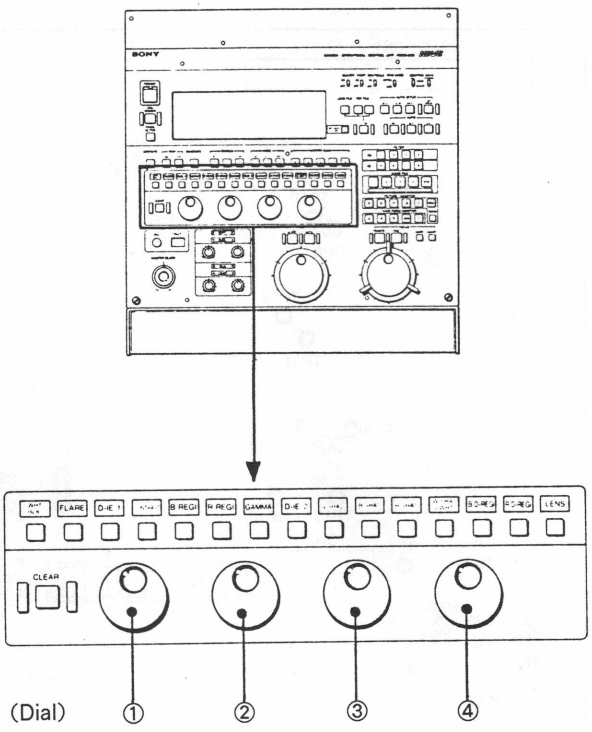
Dials ① to ④



← CH-1 or CH-2

← CH-3

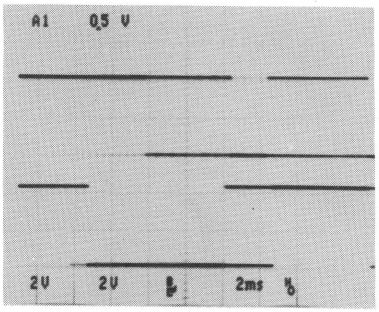
Focus dial, Iris dial



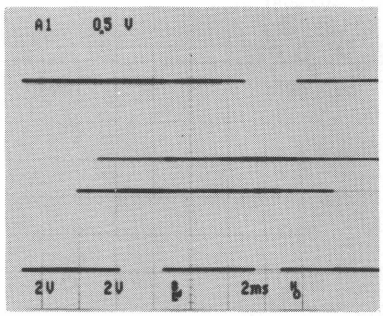
Test points when checking dial operation

	Dial ①	Dial ②	Dial ③	Dial ④	Focus Dial	Iris Dial
Oscilloscope CH-1 input	TP19/CP-130	TP31/CP-130	TP23/CP-130	TP35/CP-130	TP27/CP-130	TP39/CP-130
Oscilloscope CH-2 input	TP20/CP-130	TP32/CP-130	TP24/CP-130	TP36/CP-130	TP28/CP-130	TP40/CP-130
Oscilloscope CH-3 input	TP18/CP-130	←	←	←	←	←

3. Checking of dial operation 2
   Confirm that the following waveform is output at each points, when turning each dials clockwise or counterclockwise.



Waveform when turning a dial clockwise



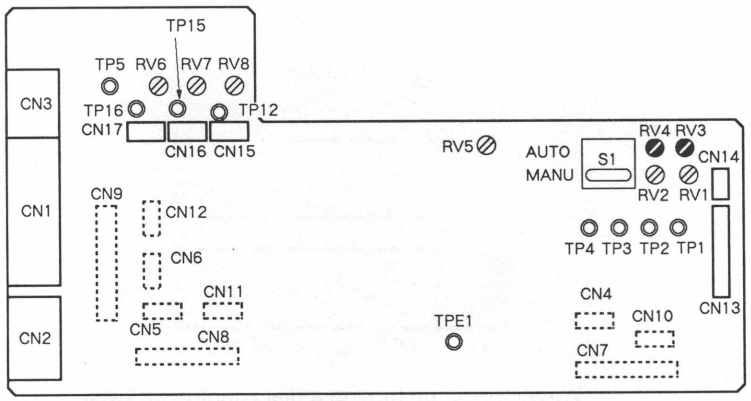
Waveform when turning a dial counterclockwise

Test points when checking dial operation

	Dial ①	Dial ②	Dial ③	Dial ④	Focus Dial	Iris Dial
Oscilloscope CH-1 input	TP21/CP-130	TP33/CP-130	TP25/CP-130	TP37/CP-130	TP29/CP-130	TP41/CP-130
Oscilloscope CH-2 input	TP22/CP-130	TP34/CP-130	TP26/CP-130	TP38/CP-130	TP30/CP-130	TP42/CP-130

3-1. CC FILTER SERVO ADJUSTMENT (HDC)

Note: Confirm that the lens iris is closed.



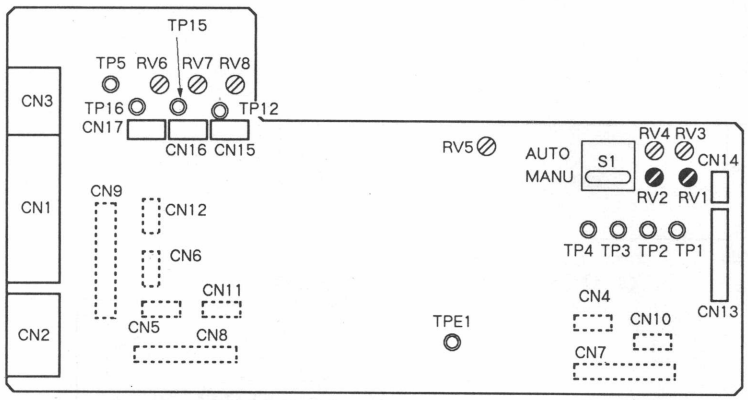
SV-107 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Press the CC filter select button [A] on the HDCO operation panel. (This button will light up.)
   Adjust ⊘ RV4 (CC-A)/SV-107 board so that the CC filter stops at A.
2. Press the CC filter select button [D] on the HDCO operation panel. (This button will light up.)
   Adjust ⊘ RV3 (CC-D)/SV-107 board so that the CC filter stops at D.
3. Repeat procedures 1 and 2 several times until the CC filter operates correctly according to the indications of the filter select button.

3-2. ND FILTER SERVO ADJUSTMENT (HDC)

Note: Confirm that the lens iris is closed.



SV-107 BOARD (COMPONENT SIDE)

Adjustment procedures

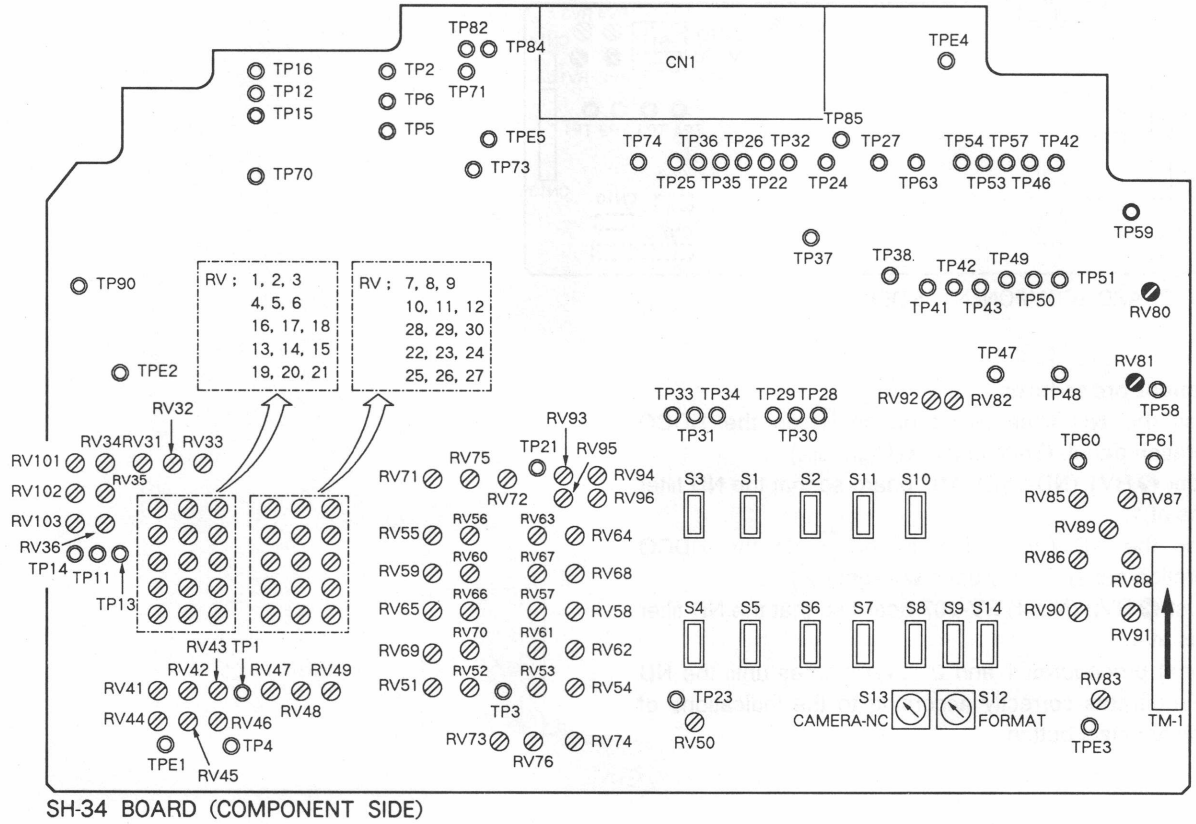
1. Press the ND filter select button [1] on the HDCO operation panel. (This button will light up.)
   Adjust ⊘ RV1 (ND-1)/SV-107 board so that the ND filter stops at 1.
2. Press the ND filter select button [4] on the HDCO operation panel. (This button will light up.)
   Adjust ⊘ RV2 (ND-4)/SV-107 board so that the ND filter stops at 4.
3. Repeat procedures 1 and 2 several times until the ND filter operates correctly according to the indications of the filter select button.

4-1. TEST SIGNAL LEVEL ADJUSTMENT 1 (HDC) (1/2)

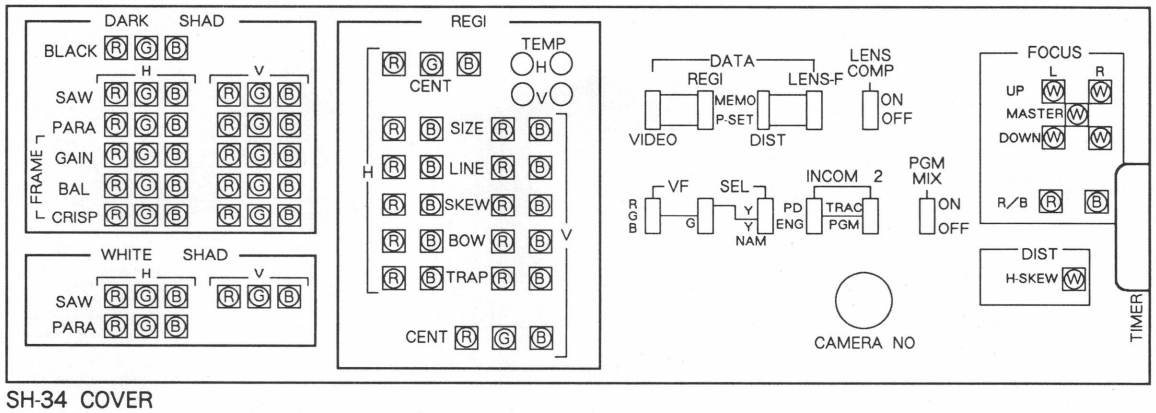
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation panel
  → ON (lights up)



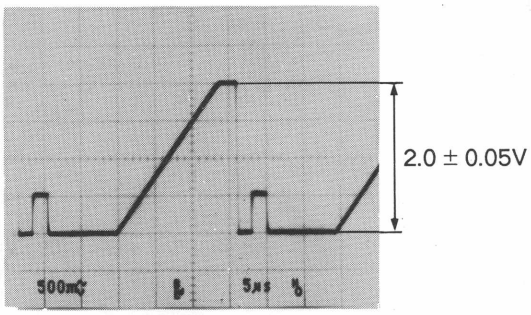
SH-34 BOARD (COMPONENT SIDE)



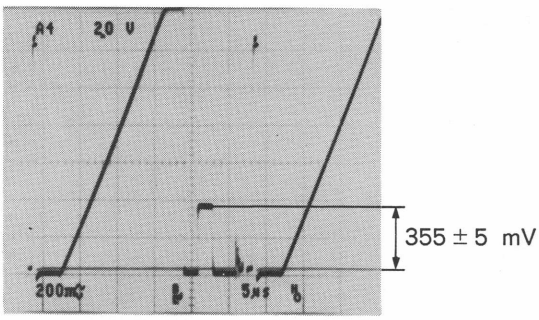
SH-34 COVER

Adjustment procedures

1. Adjust ⊘ RV81 (TEST SAW LEVEL)/SH-34 board so that the level at TP59 (GND; E4)/SH-34 board is 2.0 ± 0.05V.



2. Adjust ⊘ RV80 (TEST PLUS LEVEL)/SH-34 board so that the level at TP104 (GND; E1)/VDA-14 board is 355 ± 5 mV.



4-2. TEST SIGNAL LEVEL ADJUSTMENT 2 (HDC)

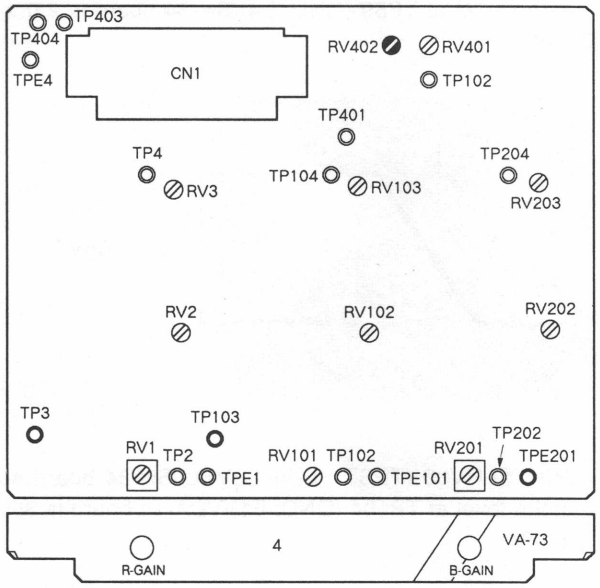
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation panel
  → ON (lights up)

To be extended: VA-73 board

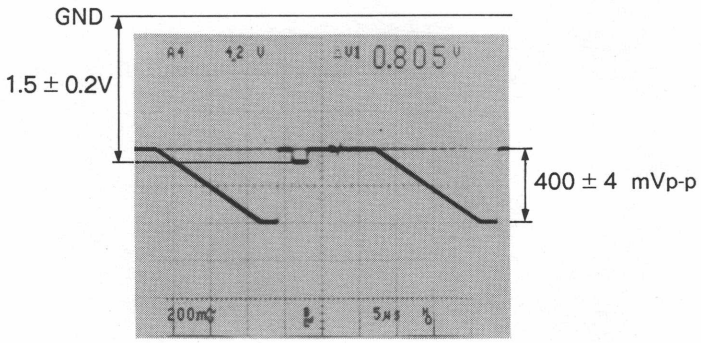
VA-73 BOARD (COMPONENT SIDE)



(PANEL SIDE)

Adjustment procedures

1. Adjust RV402 (TEST LEVEL)/VA-73 board so that the level at TP103 (GND; TPE101)/VA-73 board is 400 ± 4 mVp-p.



2. Confirm that the BLKG level is 1.5 ± 0.2V from the GND level.
3. Confirm that the same waveform is output at TP3 (GND; TPE1)/VA-73 board and at TP203 (GND; TPE1)/VA-73 board.

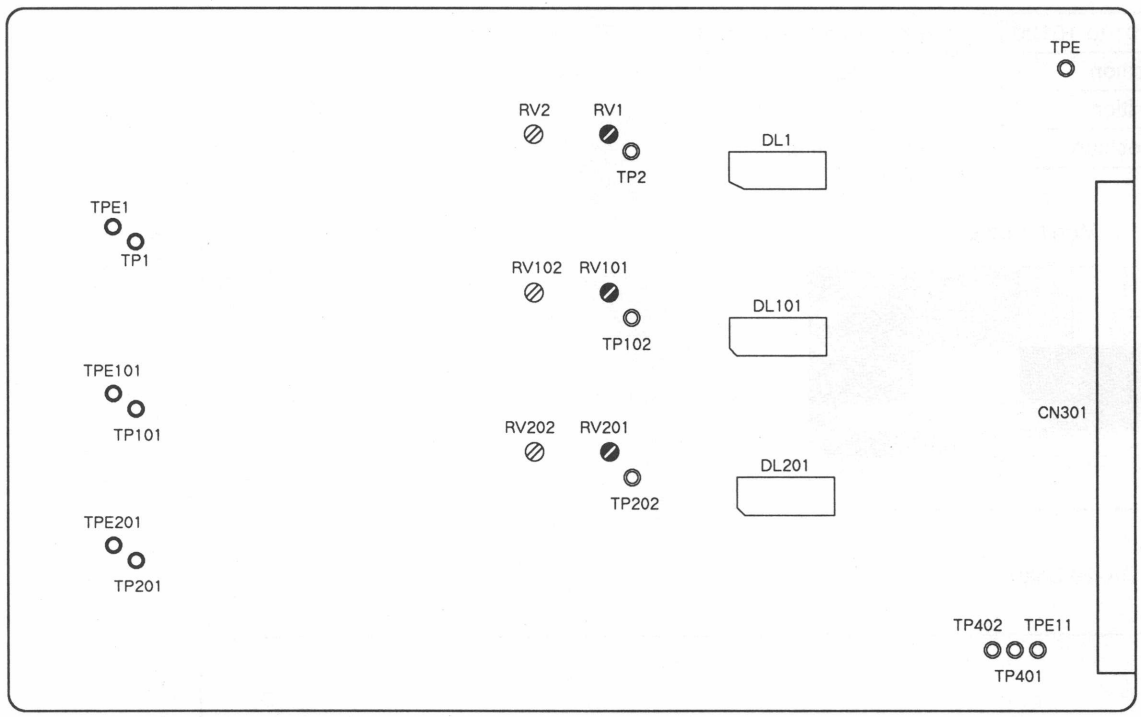
4-3. R-ch/G-ch/B-ch GAIN ADJUSTMENT (HDCS)

Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → ON (lights up)

To be extended: DA-29 board



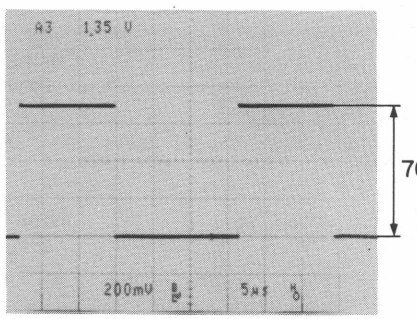
DA-29 BOARD (COMPONENT SIDE)

Adjustment procedures

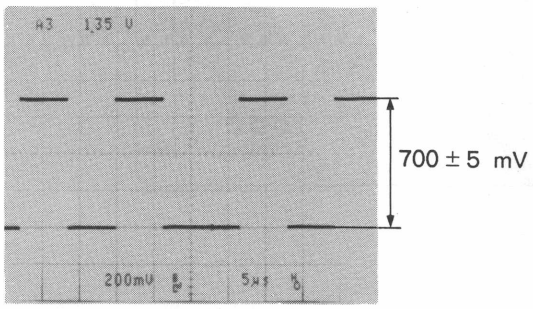
- Perform the gain adjustments at test points for each channel of G, R and B.

ch	Test point (DA-29)	Adjusting point (DA-29)	Specification
R	TP1 (GND; E1)	⊘RV1 (R GAIN)	700 ± 5 mV
G	TP101 (GND; E101)	⊘RV101 (G GAIN)	
B	TP201 (GND; E201)	⊘RV201 (B GAIN)	

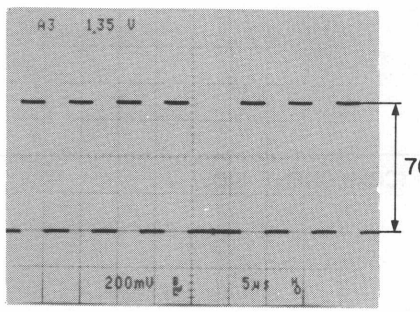
[G]



[R]



[B]



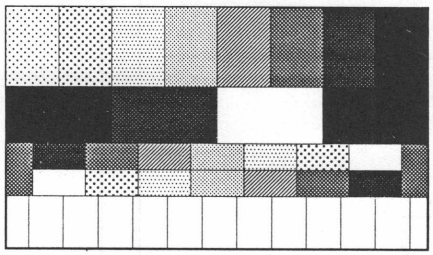
4-4. R-ch/B-ch PHASE ADJUSTMENT (HDCS) (1/2)

Preparation

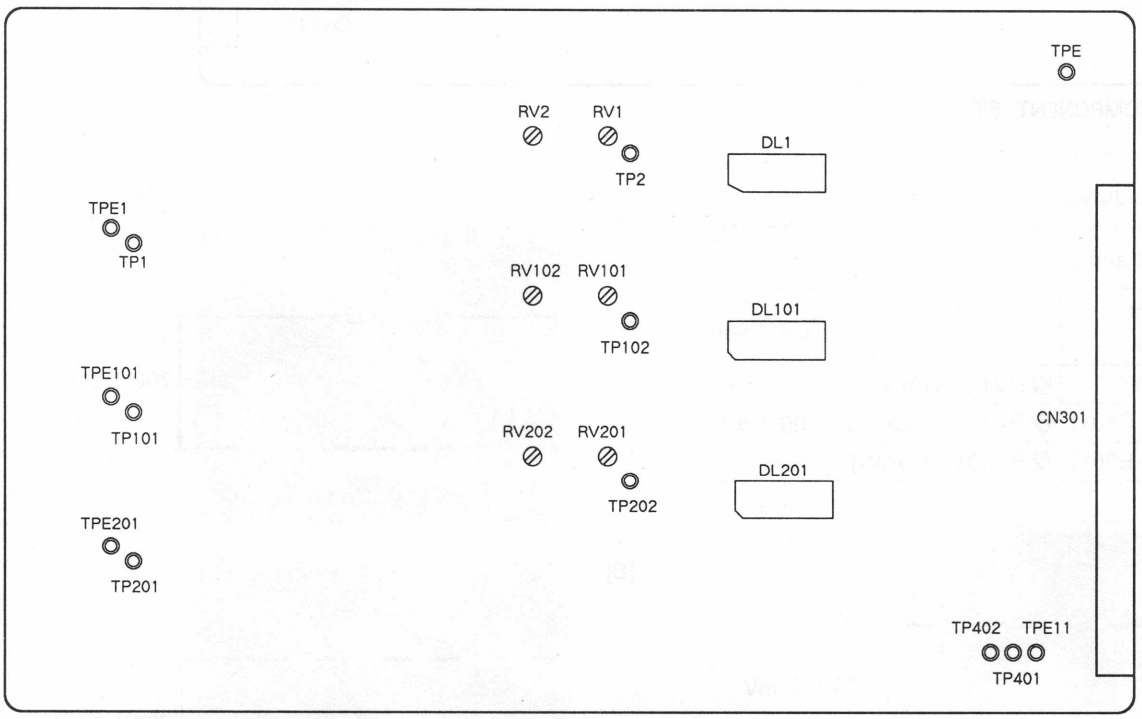
- TEST (CCU) button/HDCO Operation panel
  → ON (lights up)
- Set the switches on DT-19 board as follows, and the following pattern will be displayed on the B/W monitor.
- Switch Setting

	Serial No.10001 to 10120	Serial No. 10201 and up
S1	"4" position	"4" position
S2	"4" position	——
S8	Lower position	lower position

Monitor screen



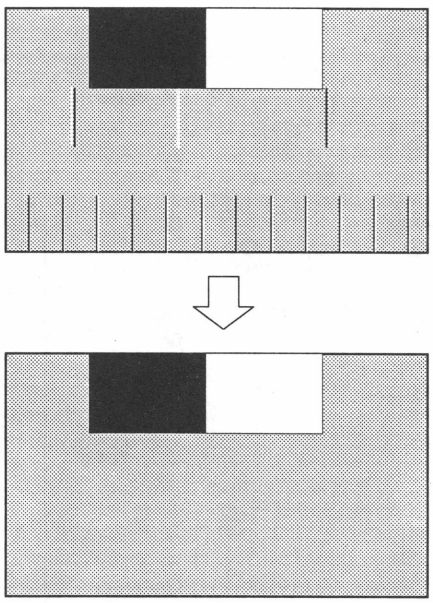
To be extended: DA-29 board



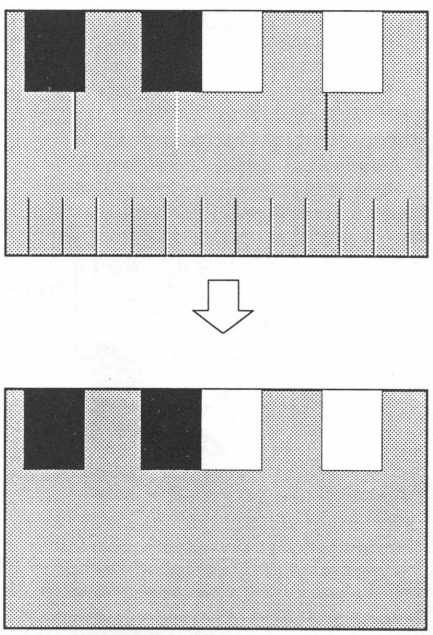
DA-29 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Press the PICTURE MONITOR buttons [R] and [–G] on the HDCO Operation panel. (They will light up.)
2. While observing the B/W monitor screen, adjust DL1 (DA-29) for no phase difference.



3. Press the PICTURE MONITOR buttons [B] and [–G] on the HDCO Operation panel. (They will light up.)
4. While observing the B/W monitor screen, adjust DL201 (DA-29) for no phase difference.



Note: After this adjustment is completed, set the switches on DT-19 board to the original position.

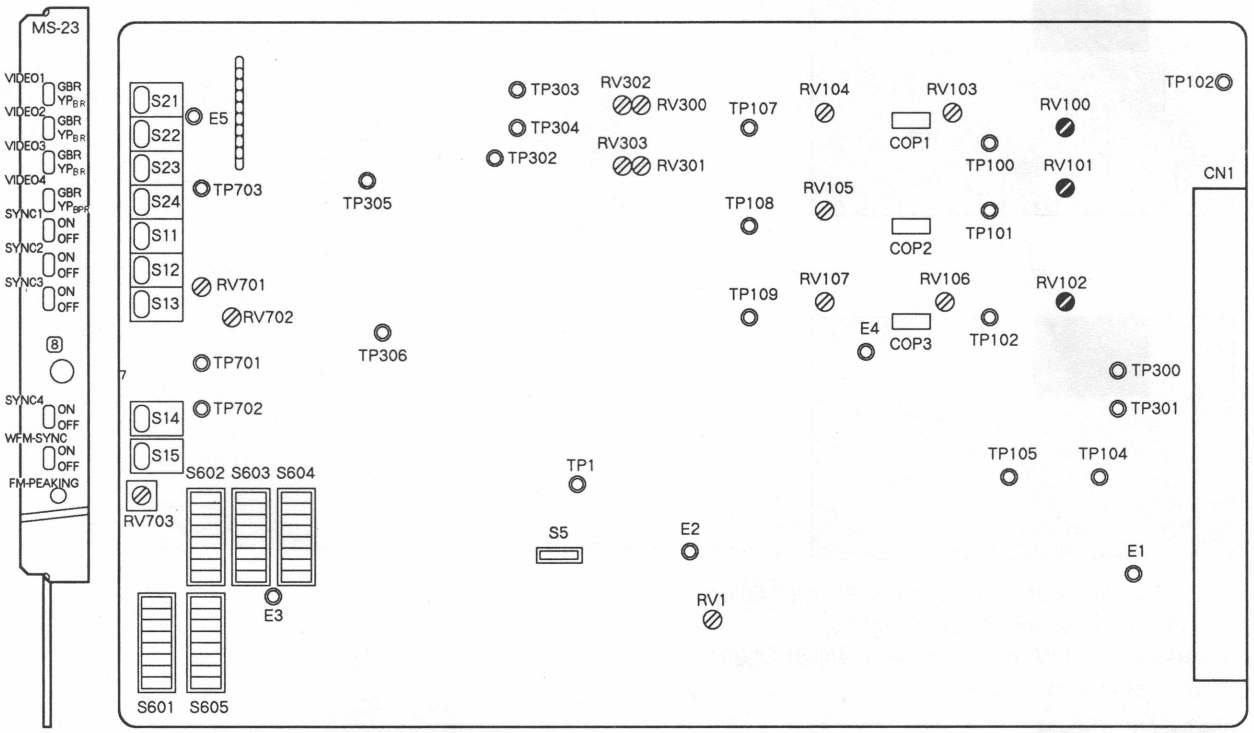
4-5. COLOR BAR LEVEL ADJUSTMENT (HDCS)

Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → ON (lights up)

To be extended: MS-23 board

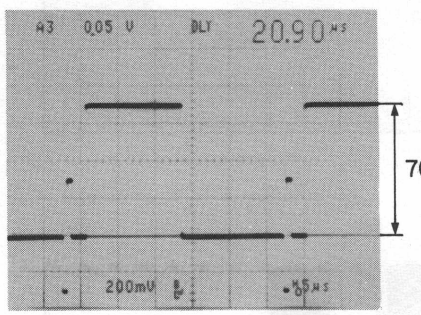


(PANEL SIDE) MS-23 BOARD (COMPONENT SIDE)

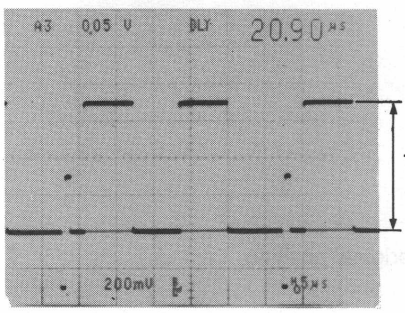
Adjustment procedures

	Test point/rear panel	Adjusting point (MS-23)	Specification
R	VIDEO 1 OUT R/PR (terminated with 75 Ω)	◐RV100 (R-GAIN)	700 ± 5 mV
G	VIDEO 1 OUT G/Y (terminated with 75 Ω)	◐RV101 (G-GAIN)	
B	VIDEO 1 OUT B/PB (terminated with 75 Ω)	◐RV102 (B-GAIN)	

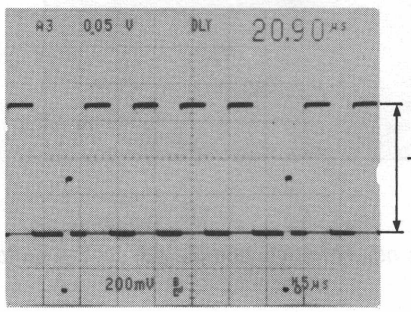
[G]



[R]



[B]



4-6. Y/PR/PB BALANCE AND GAIN ADJUSTMENT (HDCS)

Note: From the units of serial No. 10201, SMPTE-C standard and SMPTE standard are available in Y/P_R/P_B.
The units of serial No. 10001 to 10120 is only for SMPTE-C standard, therefore, follow the adjustment procedure of Y1/P_R1/P_B1. SMPTE-C corresponds to Y1/P_R1/P_B1. SMPTE corresponds to Y2/P_R2/P_B2.

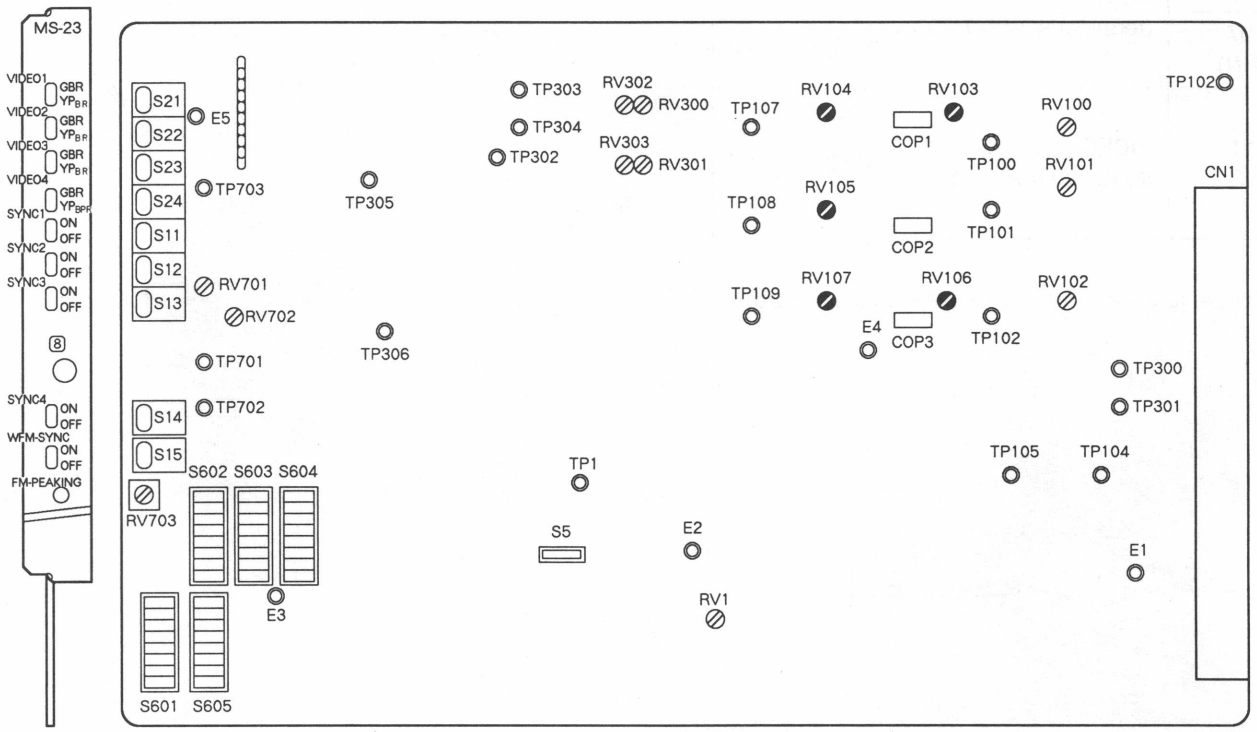
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → ON (lights up)

To be extended: MS-23 board

Trigger: TP104/MS-23 board



(PANEL SIDE) MS-23 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Set the switch S21 (VIDEO 1)/MS-23 board to Y P_R P_B.
2. It is possible to select SMPTE-C or SMPTE standard as shown in the table below by setting of the shorting plugs COP1, COP2 and COP3 on the MS-23 board.
   (Serial No. 10201 and higher)

STANDARD	COP1	COP2	COP3
SMPTE-C	P_R1	Y1	P_B1
SMPTE	P_R2	Y2	P_B2

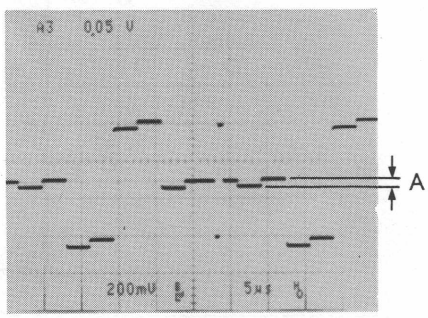
3. Adjust the following controls as shown in the table.

Adjusting point (MS-23)	Test point (rear panel)	Specification
⊘RV103 (PR BAL)	VIDEO 1 OUT R/PR (terminated with 75Ω)	A=0 ± 5 mV
⊘RV104 (PR GAIN)		B=700 ± 5 mV
⊘RV106 (PB BAL)	VIDEO 1 OUT B/PB (terminated with 75Ω)	A=0 ± 5 mV
⊘RV107 (PB GAIN)		B=700 ± 5 mV
⊘RV105 (Y GAIN)	VIDEO 1 OUT G/Y (terminated with 75Ω)	B=700 ± 5 mV

4. The following waveforms are for SMPTE-C standard.

[PR]

NG



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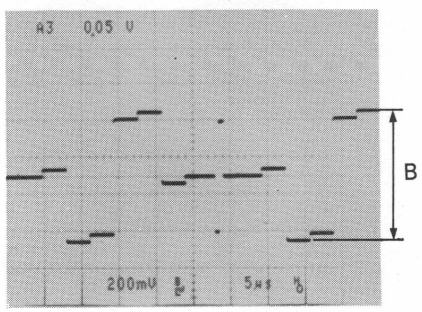
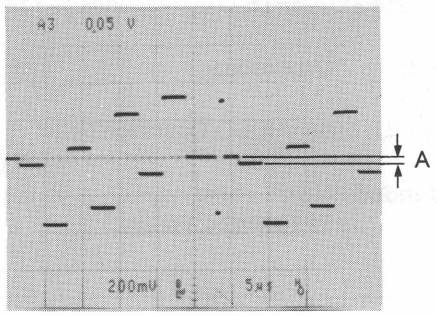


[PB]

NG



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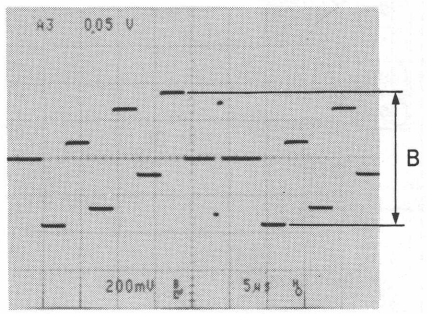
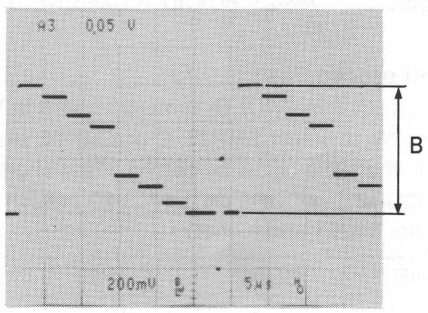


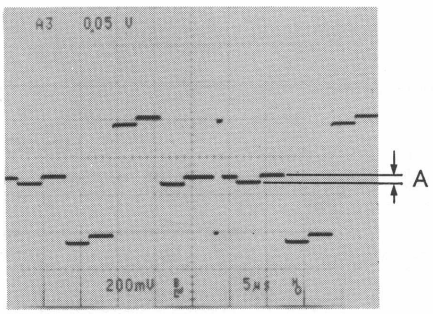
[Y]



5. The following waveforms are for SMPTE standard.

[PR]

NG



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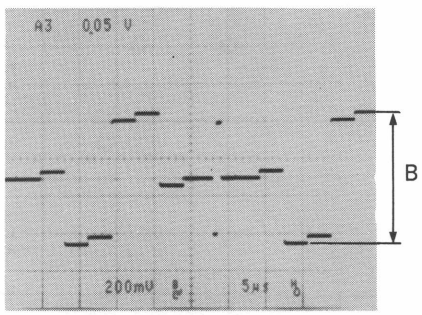
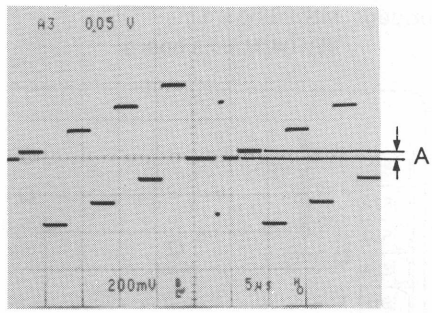


[PB]

NG



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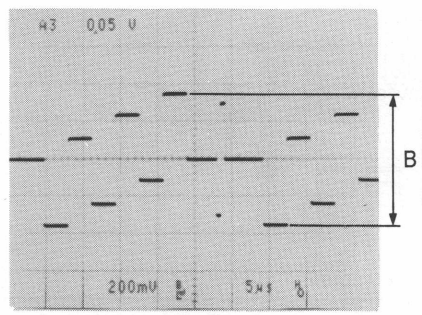
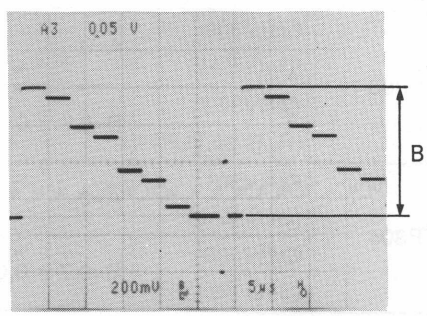


[Y]



6. Set the switch S21 (VIDEO 1)/MS-23 board to the original position.

4-7. R-G/B-G BALANCE ADJUSTMENT (HDCS) (1/2)

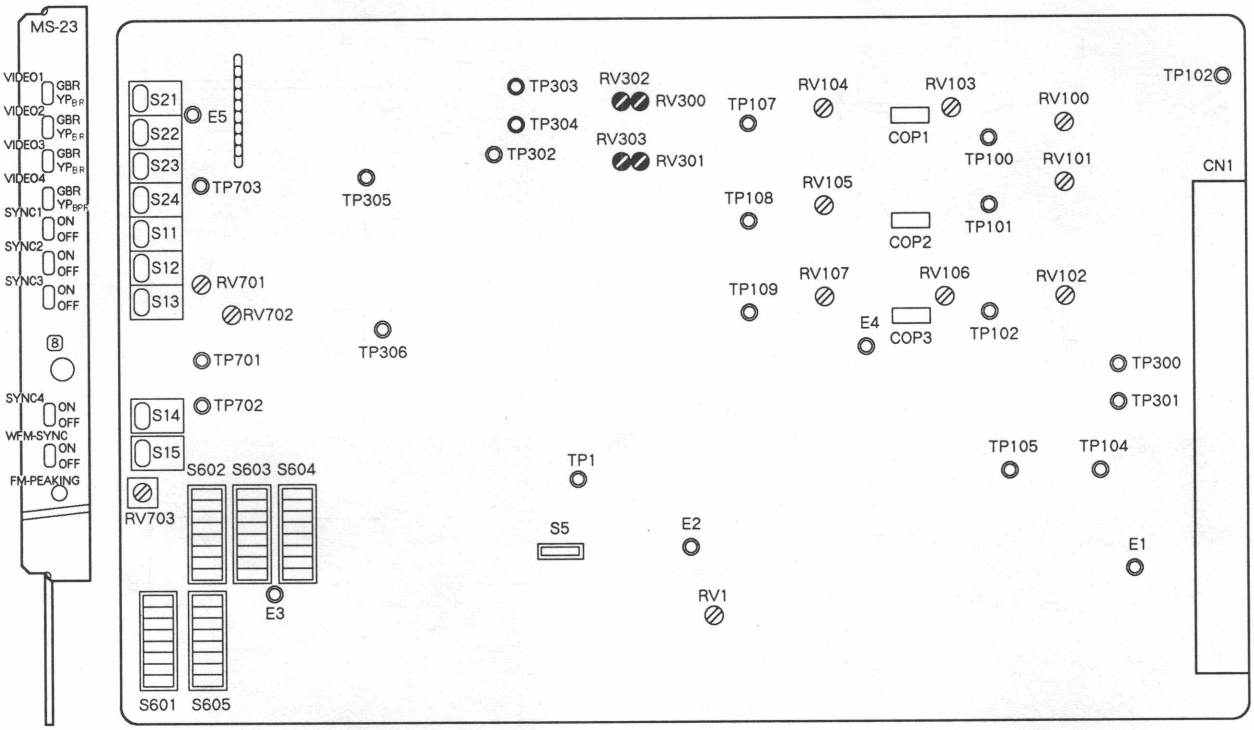
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel → ON (lights up)

To be extended: MS-23 board

Trigger: TP104/MS-23 board



(PANEL SIDE) MS-23 BOARD (COMPONENT SIDE)

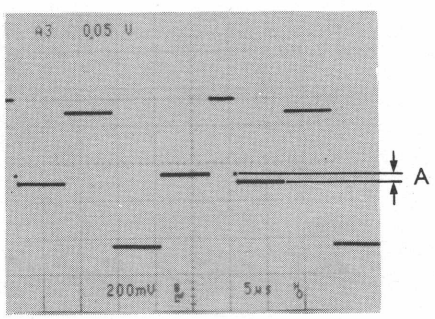
Adjustment procedures

Adjust the following controls so that the waveforms shown below are output.

	Test point (MS-23)	Adjusting point (MS-23)	Specification
R-G	TP303	RV300 (R–G BAL)	A=0
		RV302 (R–G SETUP)	B=0.7 ± 0.01V
B-G	TP304	RV301 (B–G BAL)	A=0
		RV303 (B–G SETUP)	B=0.7 ± 0.01 mV

[R-G]

NG



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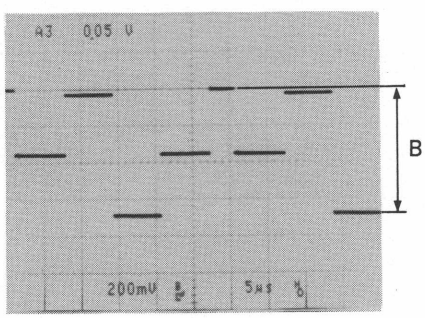
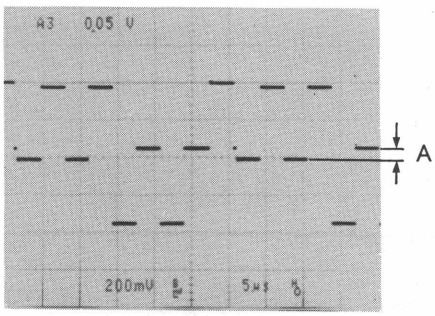


[B-G]

NG



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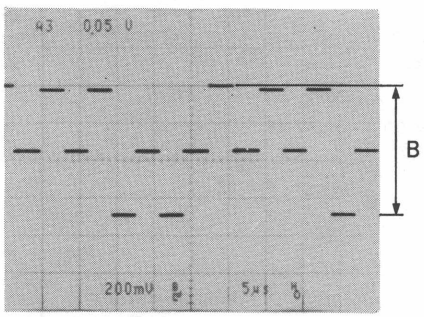


4-8. PEAKING ADJUSTMENT (HDCS)

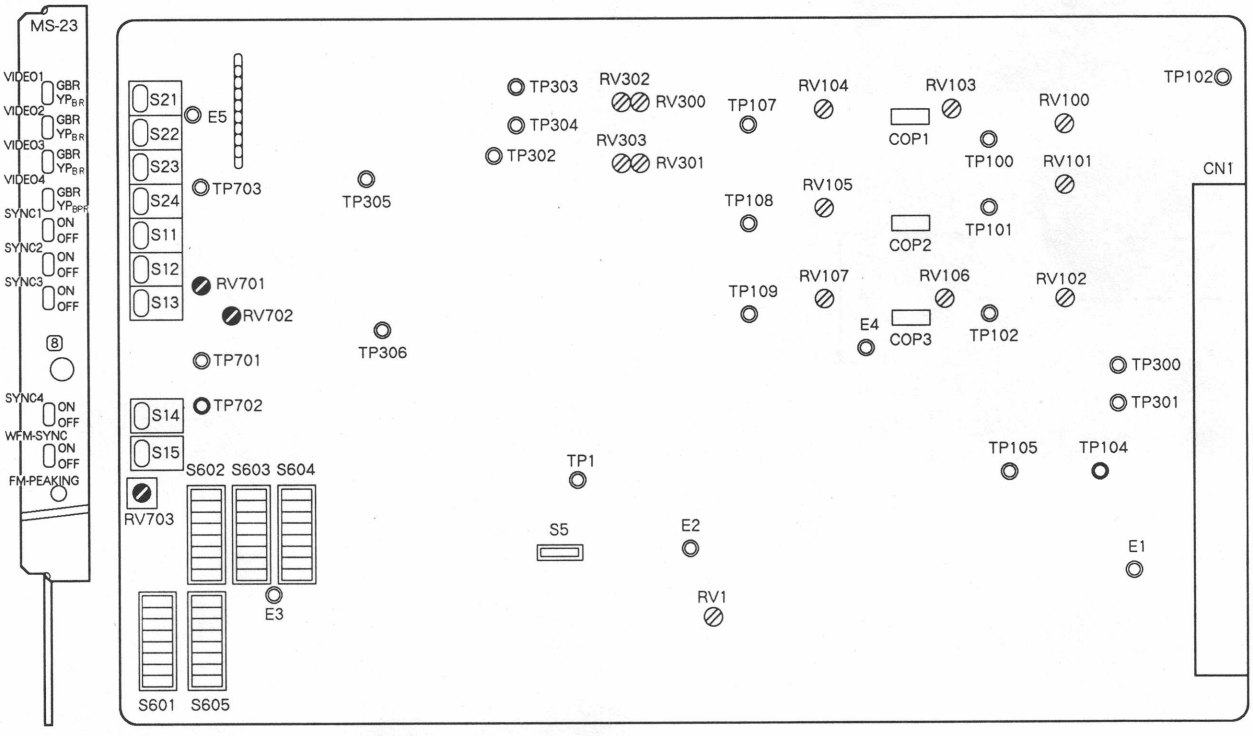
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation panel
  → ON (lights up)
- PEAKING button/HDCO Operation panel
  → ON (lights up)

To be extended: MS-23 board

Trigger: TP104/MS-23 board

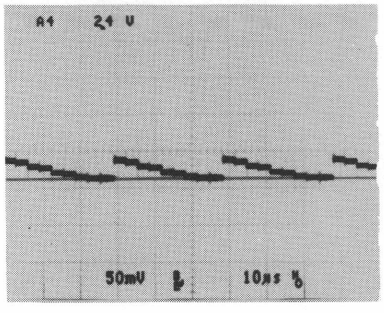


(PANEL SIDE) MS-23 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Adjust ◐ RV701 (DTL BAL)/MS-23 board so that the waveform at TP702/MS-23 board is flat.
2. Shoot any object and adjust ◐ RV702 (CRISP) and ◐ RV703 (PEAKING)/MS-23 board so that the gain and crispening are set to a proper levels while observing the monitor.

NG



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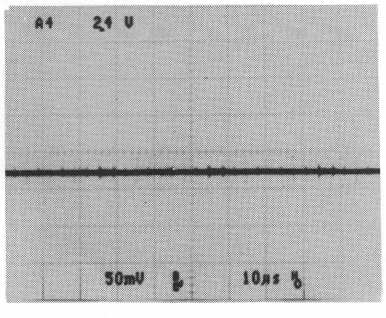


Note: After this adjustment is completed, set the TEST (CCU) and PEAKING buttons on the HDCO control panel to OFF.

4-9. TEST SIGNAL LEVEL ADJUSTMENT 3 (HDCS)

Note: Always turn S2 (TEST) on the IV-18 board to OFF just after this adjustment. If it is left with ON, the signal is not supplied from the camera to HDCS.

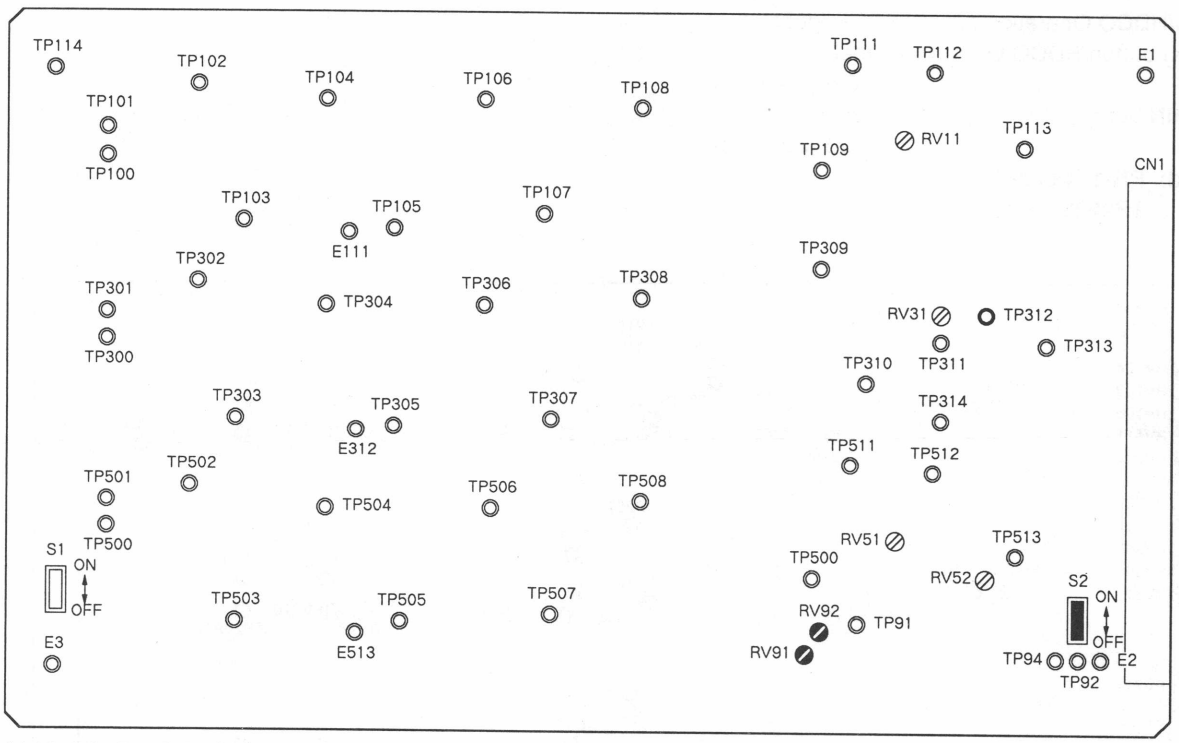
Equipment: Oscilloscope

Preparation

- CHU POWER button/HDCO Operation panel
  → ON (goes off)

To be extended: IV-18 board

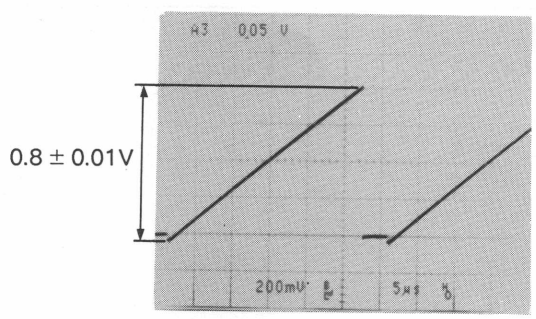
Trigger: TP92/IV-18 board



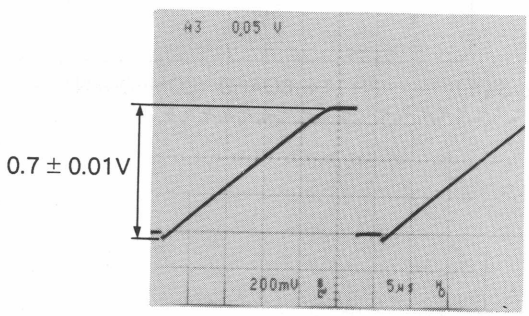
IV-18 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Set the switch S2 (TEST)/IV-18 board to ON.
2. Turn ⊘ RV92 (CUP LEVEL) fully counterclockwise (↺).
3. Adjust ⊘ RV91 (TEST LEVEL)/IV-18 board so that the level at TP312/IV-18 board is 0.8 ± 0.01V.



4. Adjust ⊘ RV92 (CLIP LEVEL)/IV-18 board so that the level at TP312 is 0.7 ± 0.01V.



5. Set the switch S2 (TEST)/IV-18 board to OFF.

4-10. VIDEO LEVEL/PEDESTAL LEVEL ADJUSTMENT (HDCS) (1/3)

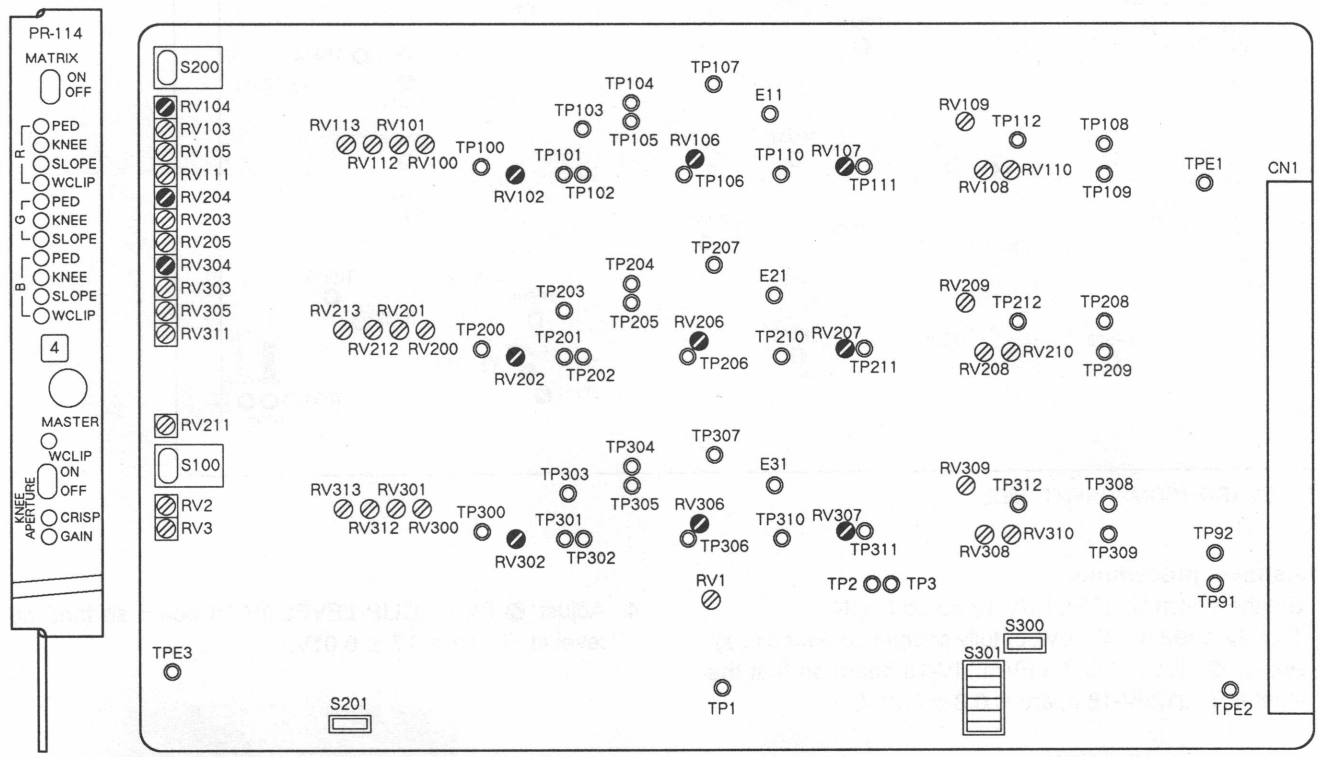
Equipment: Oscilloscope

Preparation

- CHU POWER button/HDCO Operation panel → ON (lights up)
- TEST (CCU) button/HDCO Operation panel → OFF (goes off)
- TEST (CHU) button/HDCO Operation panel → ON (lights up)
- CONTROL DATA (SYSTEM) switch /HDCO Operation panel → PRESET
- KNEE button/HDCO Operation panel → OFF (goes off)
- GAMMA (FIX) button/HDCO Operation panel → ON (lights up)
- MASTER GAIN button/HDCO Operation panel → [0] dB (lights up)

To be extended: PR-114 board

Trigger: TP92/IV-18 board



(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

Adjustment procedures

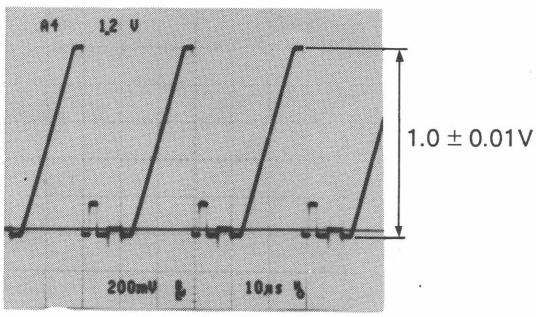
1. Set the switch S200 (MATRIX)/PR-114 board to OFF.

2.

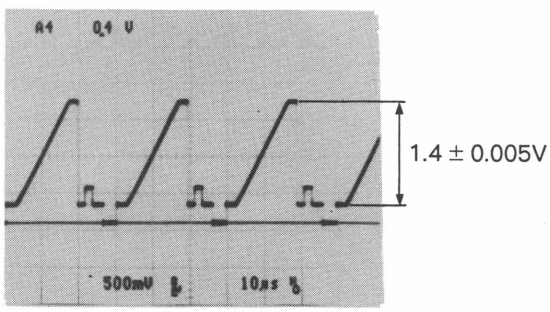
ch	Item	Test point (PR-114)	Adjusting point (PR-114)
R	Video level-1	TP101 (GND; E11)	RV102 (R GAIN 1)
	Video level-2	TP106 (GND; E11)	RV106 (R GAIN 2)
	Video level-3	TP111 (GND; E11) *	RV107 (R GAIN 3)
	Pedestal level	R OUTPUT connector/rear panel (terminated with 75 Ω)	RV104 (R PED)
G	Video level-1	TP201 (GND; E21)	RV202 (G GAIN 1)
	Video level-2	TP206 (GND; E21)	RV206 (G GAIN 2)
	Video level-3	TP211 (GND; E21) *	RV207 (G GAIN 3)
	Pedestal level	G OUTPUT connector/rear panel (terminated with 75 Ω)	RV204 (G PED)
B	Video level-1	TP301 (GND; E31)	RV302 (B GAIN 1)
	Video level-2	TP306 (GND; E31)	RV306 (B GAIN 2)
	Video level-3	TP311 (GND; E31) *	RV307 (B GAIN 3)
	Pedestal level	B OUTPUT connector/rear panel (terminated with 75 Ω)	RV304 (B PED)

* Perform procedures from 3 to 9 for channels of R, G and B, seeing the above table.

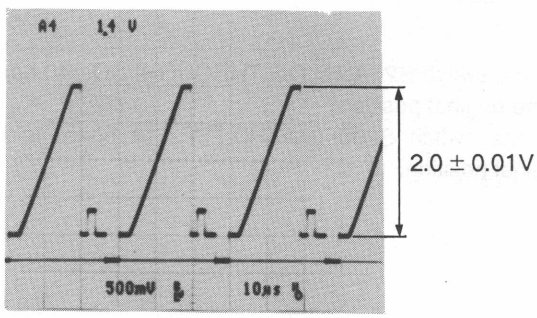
3. Adjust the control (GAIN 1) so that the peak level is 1.0 ± 0.01V.



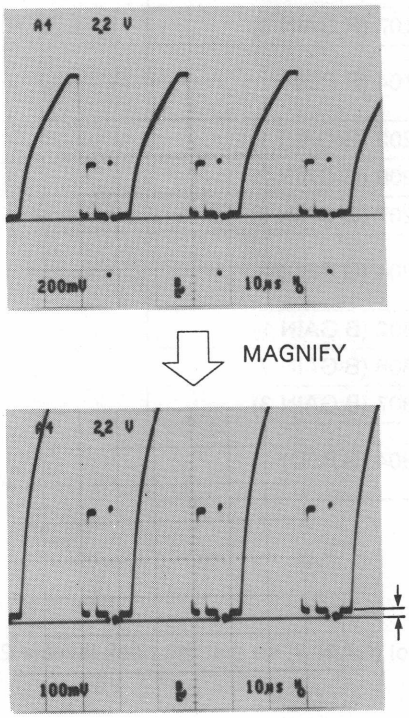
4. Turn the control (PED) fully clockwise (↻).
5. Adjust the control (GAIN 2) so that the peak level is 1.4 ± 0.005V.



6. Adjust the control (GAIN 3) so that the peak level is 2.0 ± 0.01V.



7. S2 (ANALOG THROUGH)/SG-140 board
   → AS (Serial No:up to 10100)
   → ON (Serial No:10101 and higher)
8. Adjust the control (PED) so that pedestal level at the OUTPUT connector is 20 ± 2 mV.

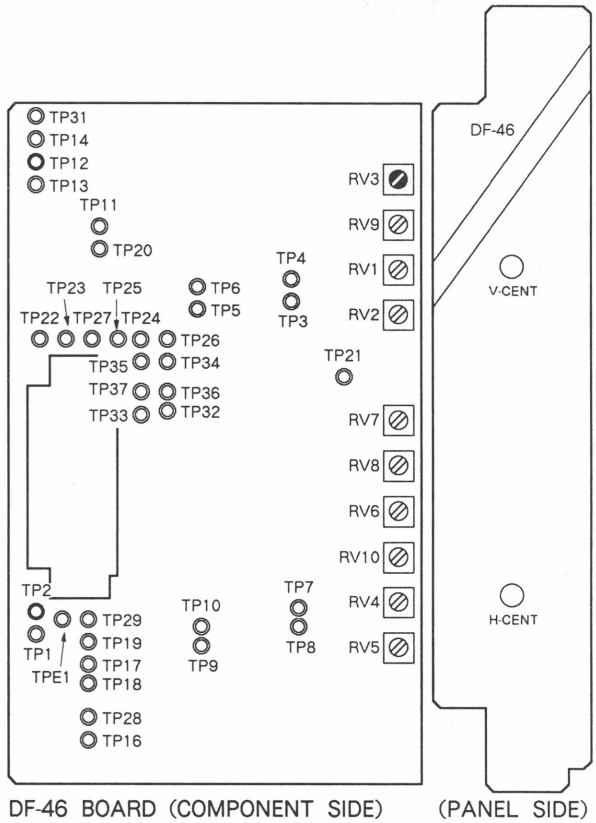


9. Set the switch S2 (ANALOG THROUGH)/SG-140 board to the original position.
10. Set the switch S200 (MATRIX)/PR-114 board to the original position.

Note: After this adjustment is completed, reset the buttons on the HDCO Operation panel.

5-1. H DEFLECTION BALANCE ADJUSTMENT (HDC)

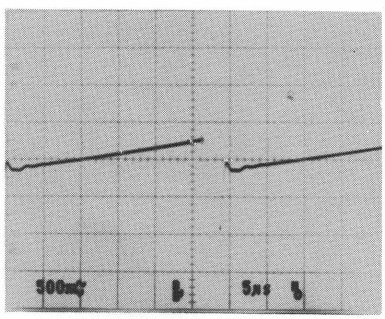
Equipment: Oscilloscope
To be extended: DF-46 board
Trigger: TP2/DF-46 board



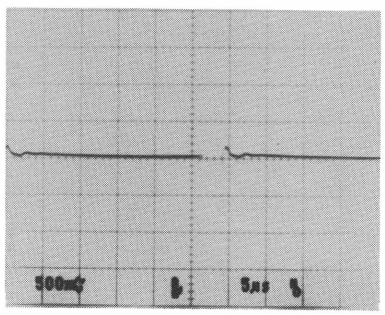
Adjustment procedures

- Adjust ⊘ RV3 (H BAL)/DF-46 board so that the waveform at TP12 (GND; E1)/DF-46 board is flat.

NG

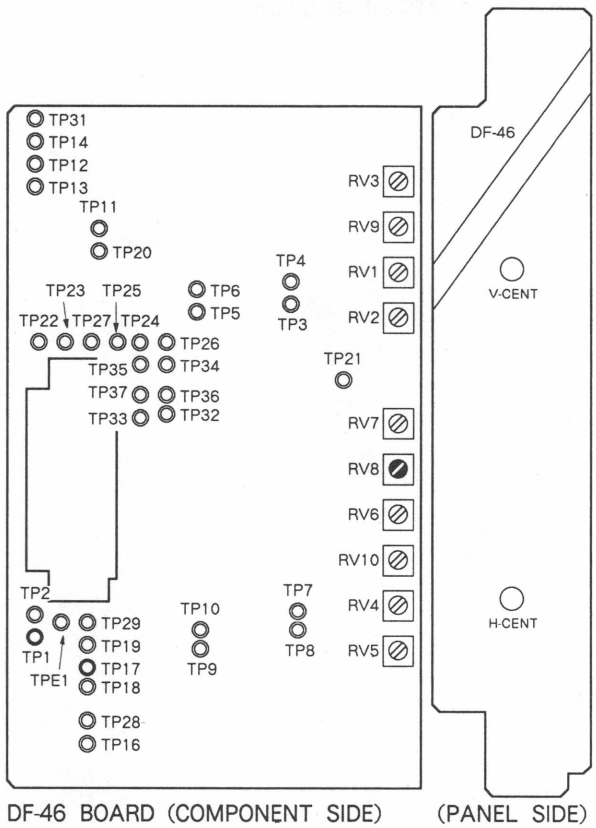


OK



5-2. V DEFLECTION BALANCE ADJUSTMENT (HDC)

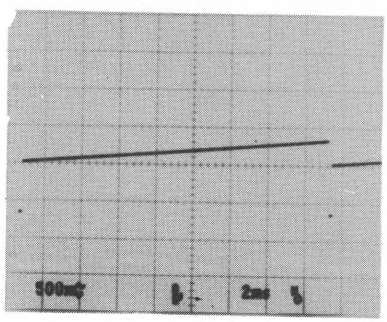
Equipment: Oscilloscope
To be extended: DF-46 board
Trigger: TP1/DF-46 board



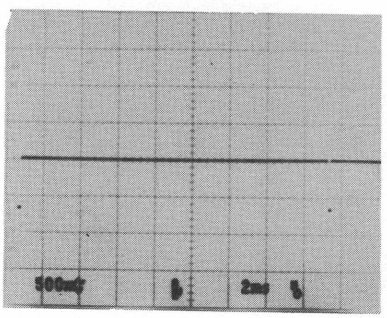
Adjustment procedures

- Adjust ⊘ RV6 (V BAL)/DF-46 board so that the waveform at TP17/DF-46 board is flat.

NG



OK



5-3. BEAM PRE-ADJUSTMENT (HDC)

Note: To minimize posibility of sticking, be sure to open the lens iris for shortest time.

Equipment: Waveform monitor

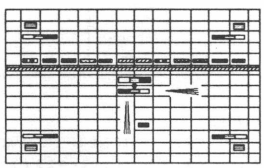
Preparation

- OPERATE button/HDCO Operation panel → ON (lights up)
- DATA VIDEO switch/SH-34 board → P-SET
- Set the reference lens on the camera head.

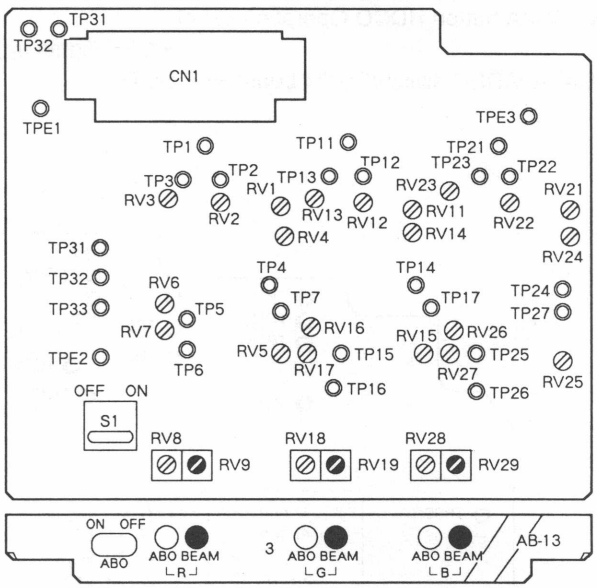
Object: Reference chart in reference lens

To be extended: AB-13 board

Monitor screen



AB-13 BOARD (COMPONENT SIDE)



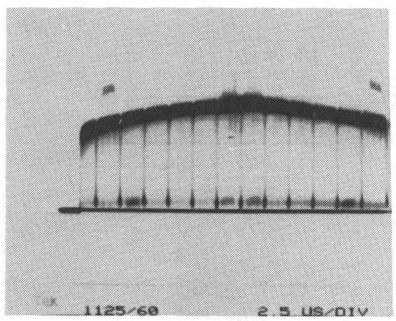
(PANEL SIDE)

Adjustment procedures

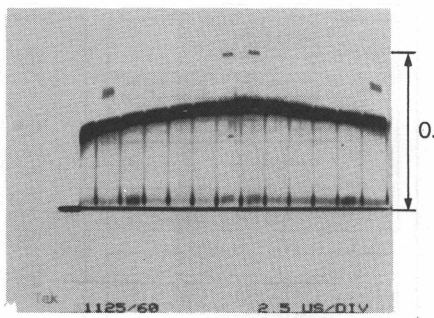
WFM buttom setting /operation panel	Adjusting point (AB-13)	Specification
R	RV9 (R BEAM)	0.7 ± 0.05 Vp-p
G	RV19 (G BEAM)	
B	RV29 (B BEAM)	

Open the lens iris slowly with IRIS control of reference lens and adjust so that the white level of the waveform monitor is 0.7 Vp-p. Adjust each control (BEAM) for R, G and B channels so as not to exceed 0.7 ± 0.05 Vp-p even when the lens iris is opened more.

NG



OK



5-4. E FOCUS PRE-ADJUSTMENT (HDC) (1/2)

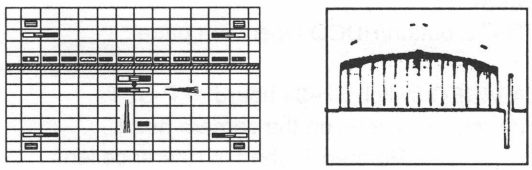
Equipment: Waveform monitor

Object: Reference chart in reference lens

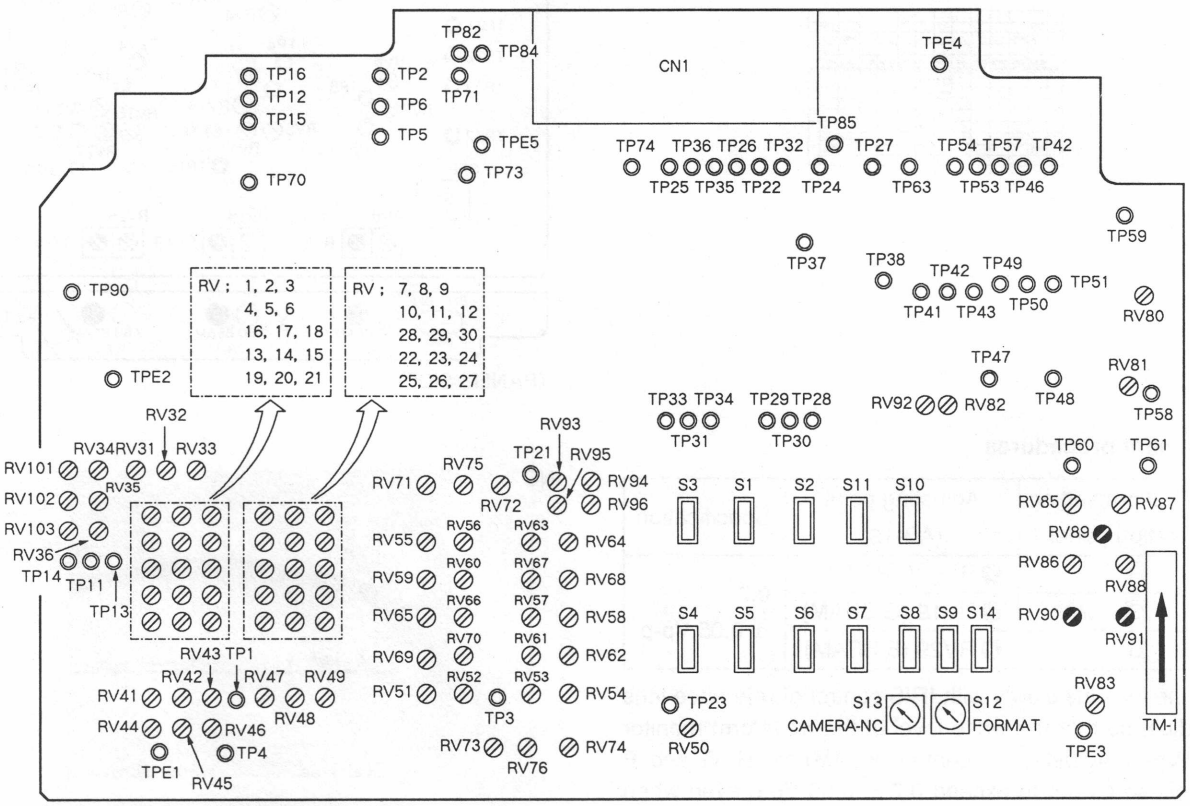
Preparation

- Set the reference lens on the camera head.
- OPERATE button/HDCO Operation panel → ON (lights up)
- GAMMA button/HDCO Operation panel → OFF (lights up)
- DATA VIDEO switch/SH-34 board → P-SET

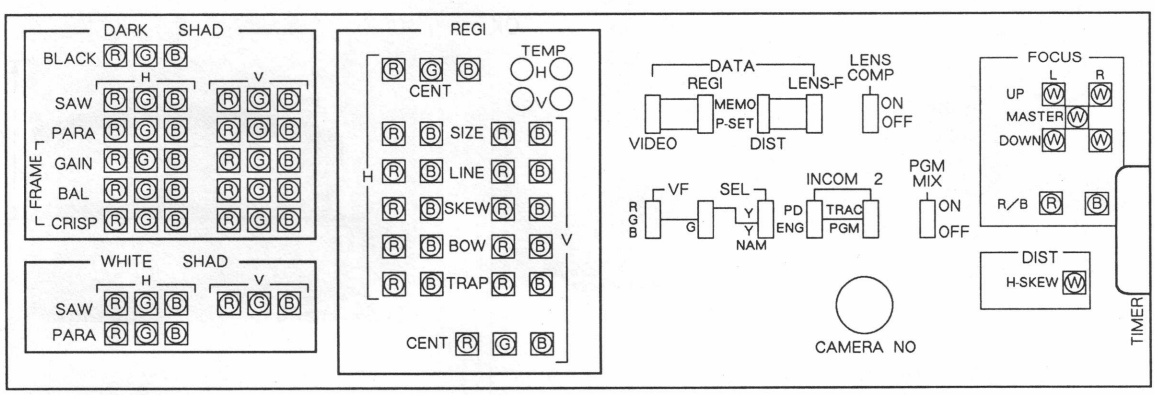
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.7 Vp-p.



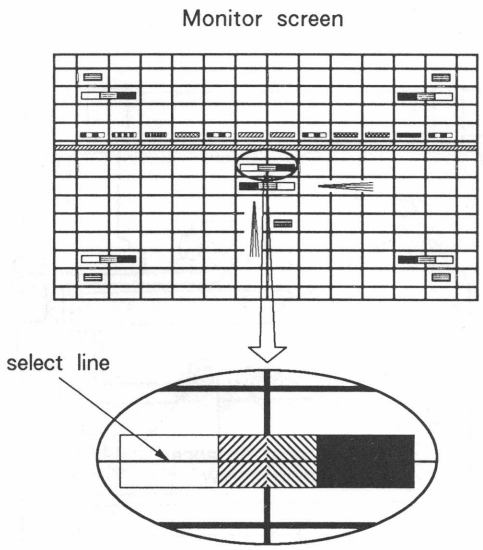
SH-34 BOARD (COMPONENT SIDE)



SH-34 COVER

Adjustment procedures

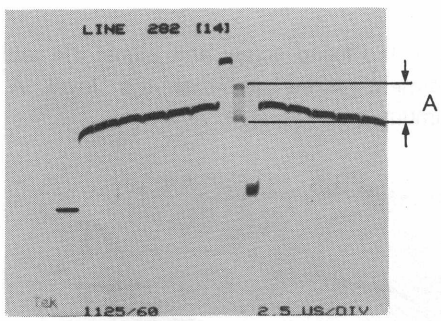
1. Set the select line on the waveform monitor as shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.



2.

WFM button setting /operation panel	Adjusting point (SH-34)
G	RV90 (R FOCUS)
R	RV89 (MASTER FOCUS)
B	RV91 (B FOCUS)

Adjust each control (FOCUS) for R, G and B channels so that the level A becomes maximum.



Note: After this adjustment is completed, set the DATA VIDEO switch/SH-34 board to MEMO.

5-5. G-CH FOCAL DISTANCE AND ROTATION ADJUSTMENT (HDC) (1/2)

Note: Perform this adjustment only when replacing the pick up tube.
Since there is a correlation between the focal distance and rotation adjustments, these two adjustments should be performed alternately until the specification is met.

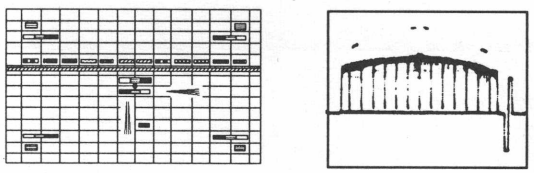
Equipment: Waveform monitor, B/W monitor

Preparation

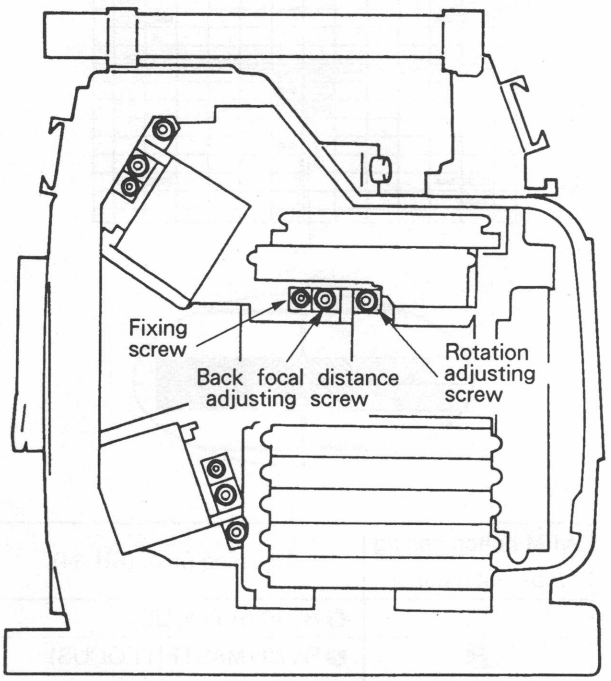
- Set the reference lens on the camera head.
- OPERATE button/HDCO Operation panel
  → ON (lights up)
- GAMMA button/HDCO Operation panel
  → OFF (lights up)
- FILTER ND button/HDCO Operation panel
  → [1] (lights up)
- FILTER CC button/HDCO Operation panel
  → [A] (lights up)
- WAVEFORM MONITOR button/HDCO Operation panel
  → [G] (lights up)
- Prepare an L-shaped hexagon wrench with width across flats of 4 mm.

Object: Reference chart in reference lens

Monitor screen **Waveform monitor**

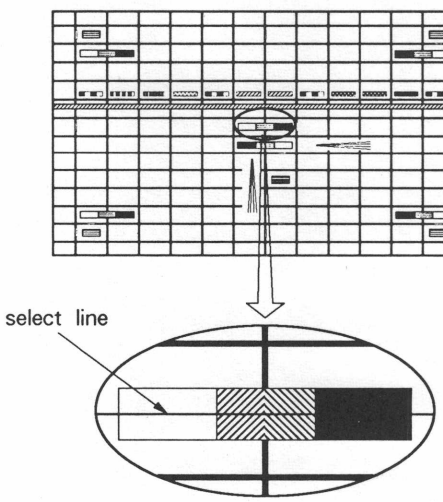


Lens iris: OPEN (Set the white level to 0.7 Vp-p by performing the reference lens brightness adjustment)

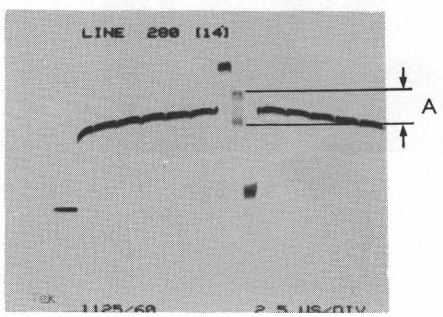


Adjustment procedures

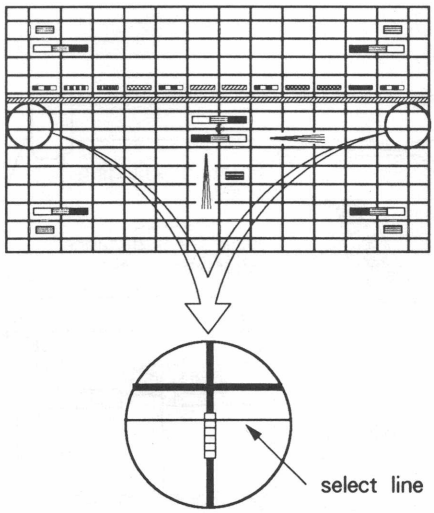
1. Set the select line on the waveform monitor as shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.



2. Loosen the fixing screw and adjust the focal distance adjustment screw so that the level A becomes maximum.



3. Adjust the G-ch rotation adjustment screw so that the marked portions on the chart shown in the figure and the select line becomes parallel.



4. Repeat procedures 2 and 3 several times.

Note: Fixing screw should be tightened firmly but not excessively.

5-6. R-CH/B-CH FOCAL DISTANCE AND ROTATION ADJUSTMENT (HDC) (1/2)

Note: Perform this adjustment only when replacing the pick up tube.
Since there is a correlation between the focal distance and rotation adjustments, these two adjustments should be performed alternately until the specification is met.

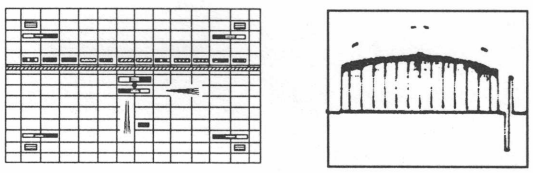
Equipment: Waveform monitor, B/W monitor

Preparation

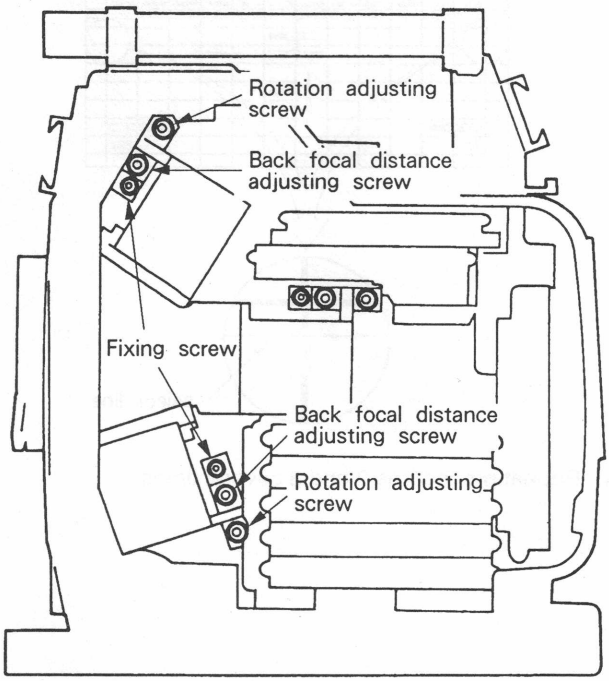
- Set the reference lens on the camera head.
- OPERATE button/HDCO Operation panel → ON (lights up)
- GAMMA button/HDCO Operation panel → OFF (lights up)
- FILTER ND button/HDCO Operation panel → [1] (lights up)
- FILTER CC button/HDCO Operation panel → [A] (lights up)
- Prepare an L-shaped hexagon wrench with width across flats of 4 mm.

Object: Reference chart in reference lens

Monitor screen **Waveform monitor**

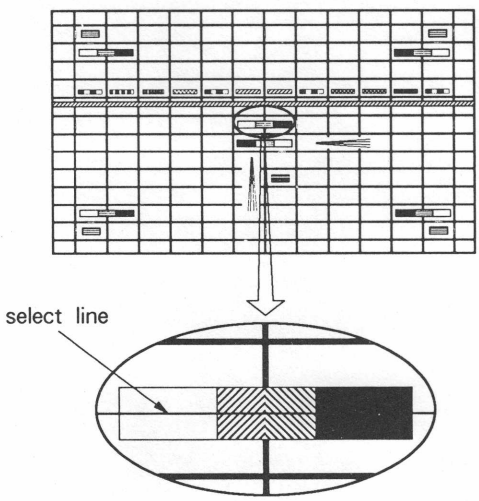


Lens iris: OPEN (Set the white level to 0.7 Vp-p by performing the reference lens brightness adjustment).

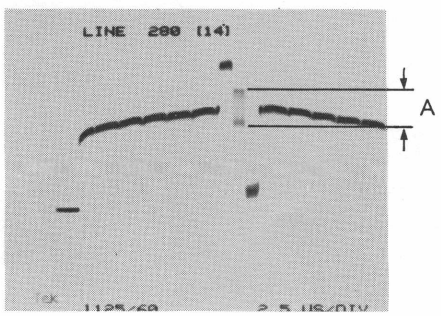


Adjustment procedures

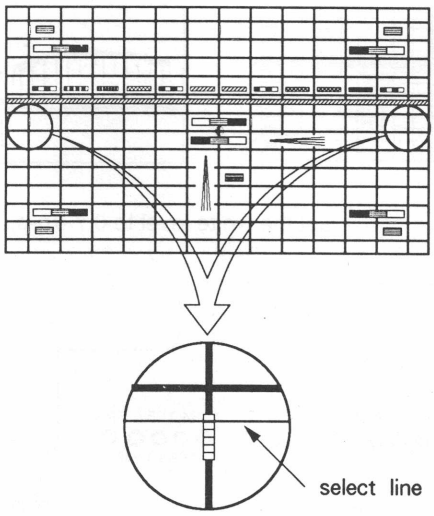
1. Select [R] of WAVEFORM MONITOR button on the HDCO operation panel. (This button will light up.)
2. Set the select line on the waveform monitor as shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.



3. Loosen the fixing screw and adjust the focal distance adjustment screw so that the level A becomes maximum.



4. Adjust the R-ch (B-ch) rotation adjustment screw so that the marked portions on the chart shown in the figure and the select line becomes parallel.



5. Repeat procedures 3 and 4 several times.
6. Select [B] of WAVEFORM MONITOR button. (This button will light up.)
   Perform procedures from 2 to 5 for B-ch adjustment.

Note: Fixing screw should be tightened firmly but not excessively.
After this adjustment is completed, select [Y] of WAVEFORM MONITOR button.

5-7. G-ch CENTERING ADJUSTMENT (HDC) (1/2)

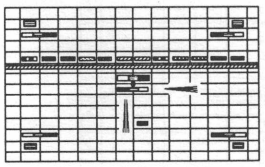
Equipment: B/W monitor (or color monitor)

Object: Reference chart in reference lens.

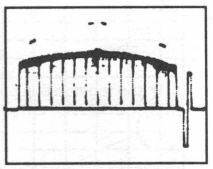
Preparation

- Set the reference lens on the camera head.

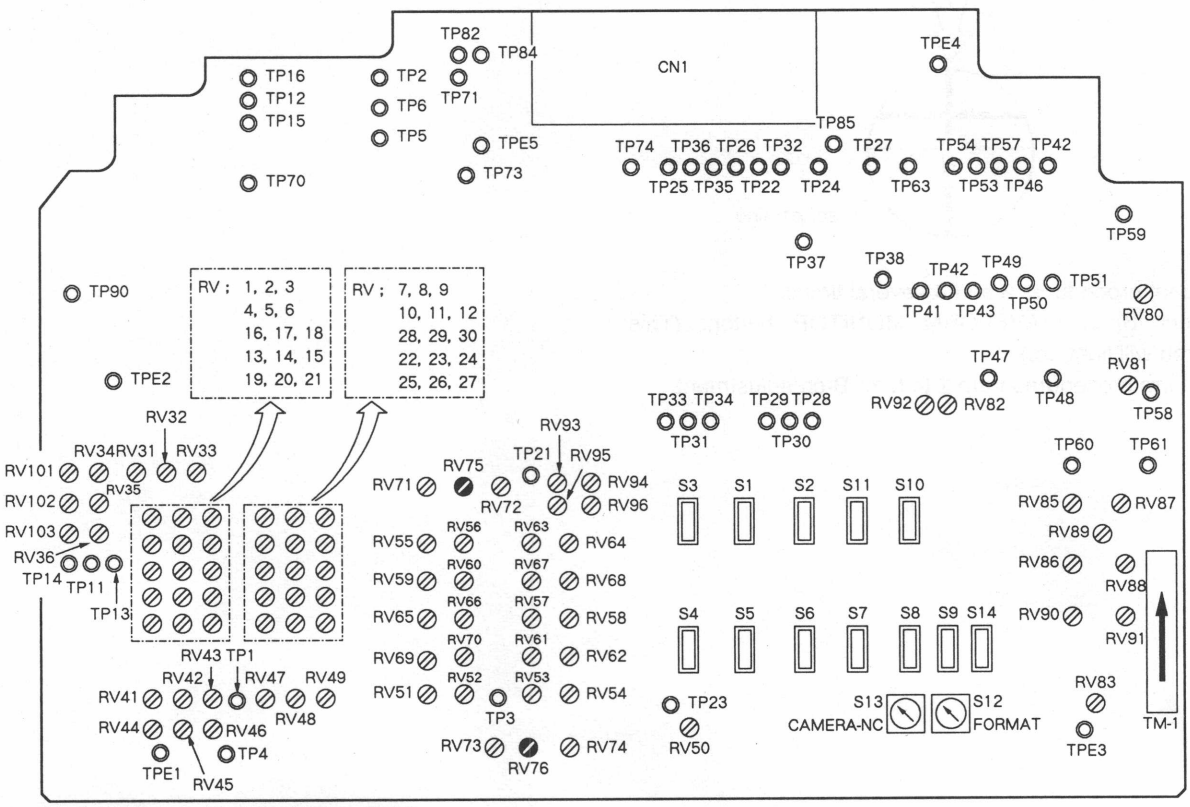
Monitor screen



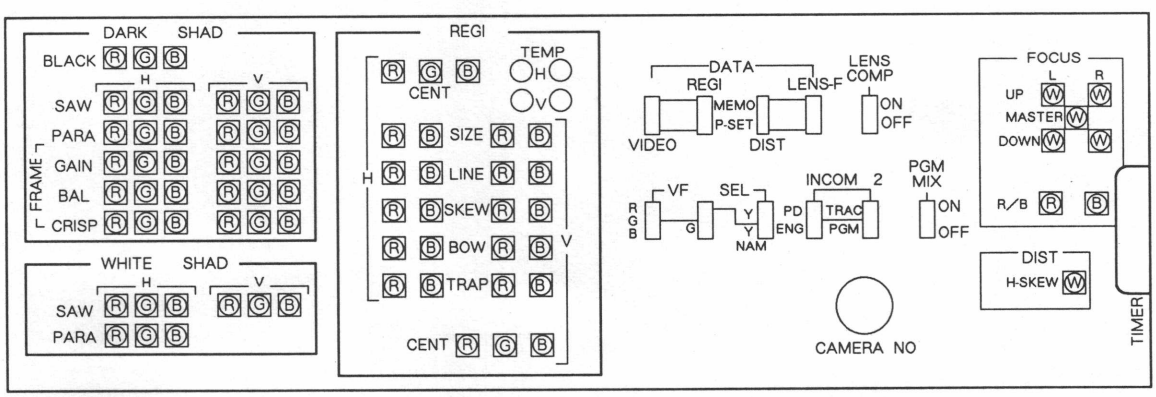
Waveform monitor



Lens iris: Set the white level to 0.7 Vp-p.



SH-34 BOARD (COMPONENT SIDE)

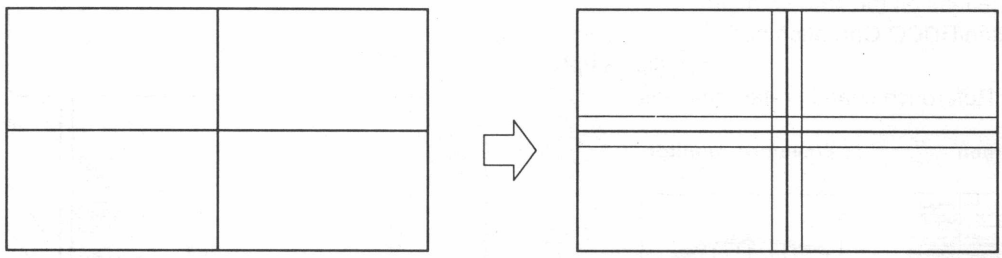


SH-34 COVER

Adjustment procedures

1. Select [Y] of PICTURE MONITOR button on the HDCO control panel. (This button will light up.) The following picture will be monitored.

(Example)



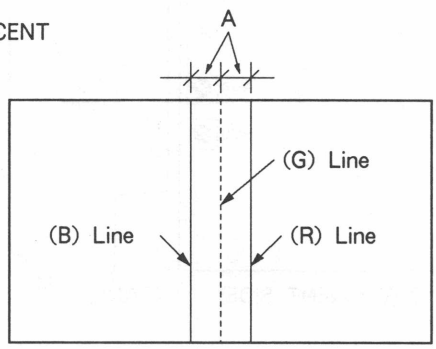
(Object)

The above picture will be monitored when the registration error occurs.

(Monitor screen)

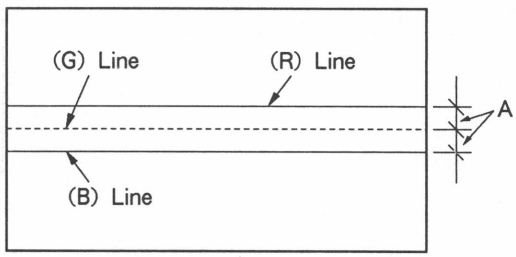
2. Trace the position of R, G and B pictures by pressing the PICTURE MONITOR buttons of [R], [G] and [B]. When using a color monitor, skip this procedure.

H-CENT



(Monitor)

V-CENT



(Monitor)

3. Adjust ● RV75 (G-H CENT) and ● RV76 (G-V CENT)/SH-34 board so that the G-ch line is positioned between the R-ch and B-ch lines.

5-8. PICTURE FRAME ADJUSTMENT (HDC)

Note: G-ch centering adjustment must be completed before this adjustment.

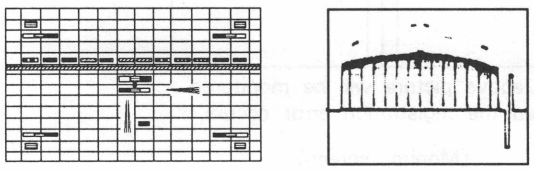
Equipment: B/W monitor

Preparation

- Set the reference lens on the camera head.
- FILTER ND button/HDCO Operation panel
  → [1] (lights up)

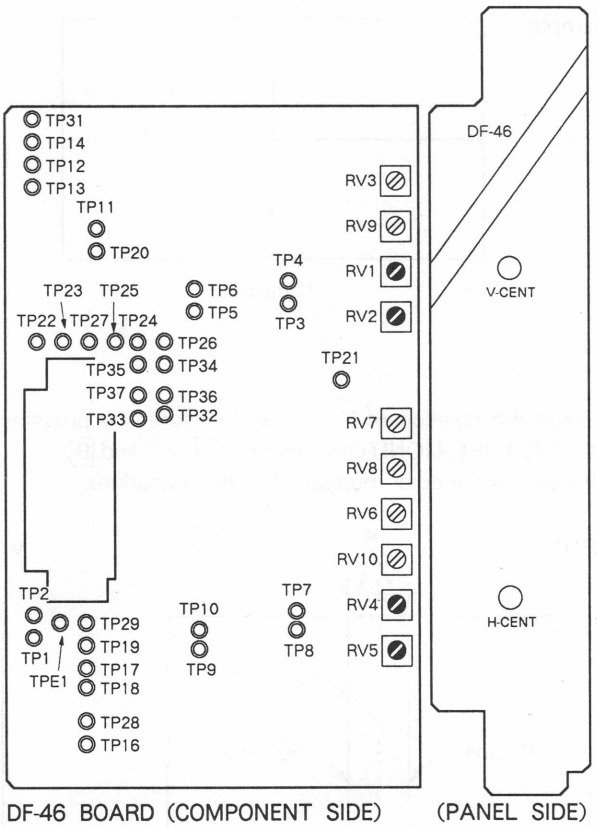
Object: Reference chart in reference lens

Monitor screen **Waveform monitor**



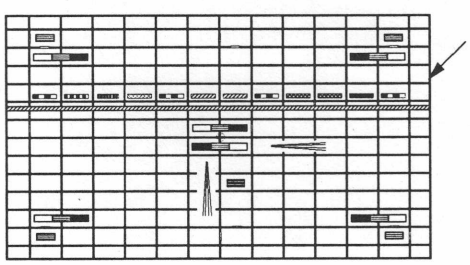
Lens iris: Set the white level to 0.7 Vp-p.

To be extended: DF-46 board



Adjustment procedures

1. Set ⊘ RV9 (H CENT) and ⊘ RV10 (V CENT)/DT-46 board to mechanical center. (As to the models with serial No. up to 10120, these controls are not mounted.)
2. Adjust ⊘ RV1 (H CENT) on the DF-46 board so that the left edge of the reference chart frame matches that of the underscanned monitor frame. Adjust ⊘ RV2 (H SIZE) so that the right edge of the reference chart frame matches that of the underscanned frame.
3. Adjust the ⊘ RV4 (V CENT) on the DF-46 board so that the top of the reference chart frame touches that of the underscanned frame. Adjust ⊘ RV5 (V SIZE) so that the bottom of the reference chart frame matches that of the underscanned frame.



4. Repeat procedures 2 and 3 several times until the underscanned monitor frame matches the reference chart frame.

5-9. QUADRATURE ADJUSTMENT (HDC) (1/2)

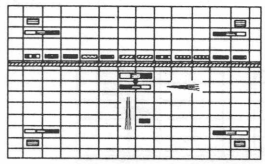
Equipment: B/W monitor

Object: Reference chart in reference lens

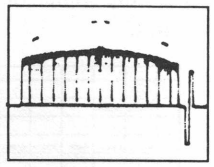
Preparation

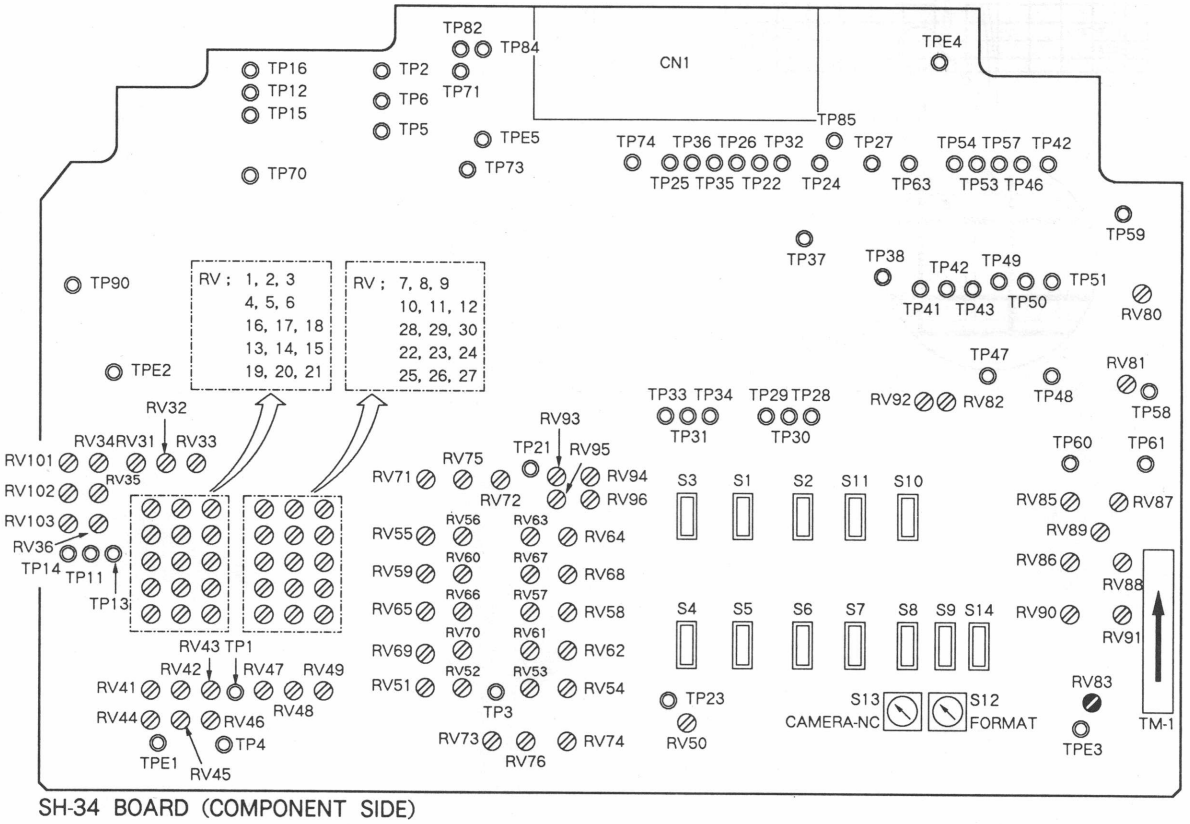
- Set the reference lens on the camera head.
- AUTO SETUP REGI button/HDCO Operation panel → ON (lights up)

Monitor screen

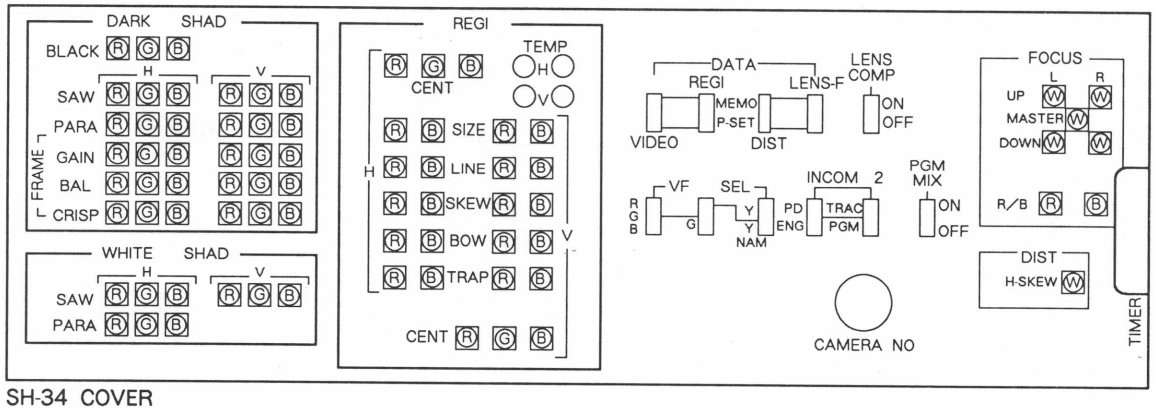


Waveform monitor





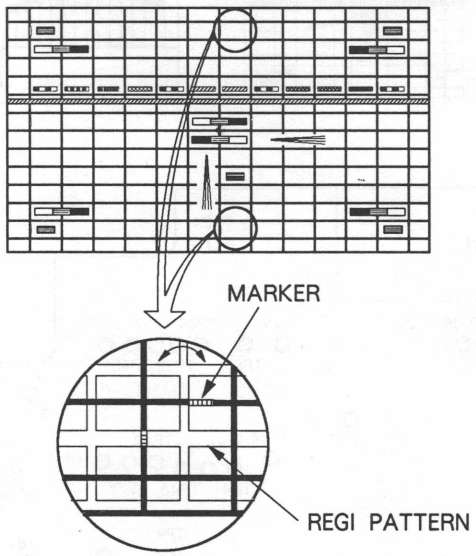
SH-34 BOARD (COMPONENT SIDE)



SH-34 COVER

Adjustment procedures

- As shown in the figure, adjust ⊘ RV83 (DISTORTION H-SKEW)/SH-34 board so that the REGI pattern becomes perpendicular to the upper and lower markers of the chart.



Note: After this adjustment is completed, set the AUTO SETUP REGI button/HDCO operation panel to OFF.

5-10. BEAM/ABO ADJUSTMENT (HDC) (1/3)

Note: To prevent the pick up tube from sticking, make the adjustment quickly or close the lens iris except when the adjustment is performed.

Equipment: Oscilloscope

Preparation

- OPERATE button/HDCO Operation panel → ON (lights up)
- MASTER GAIN button/HDCO Operation panel → [–6] dB (lights up)
- WHT BLK button/HDCO Operation panel → ON (lights up)

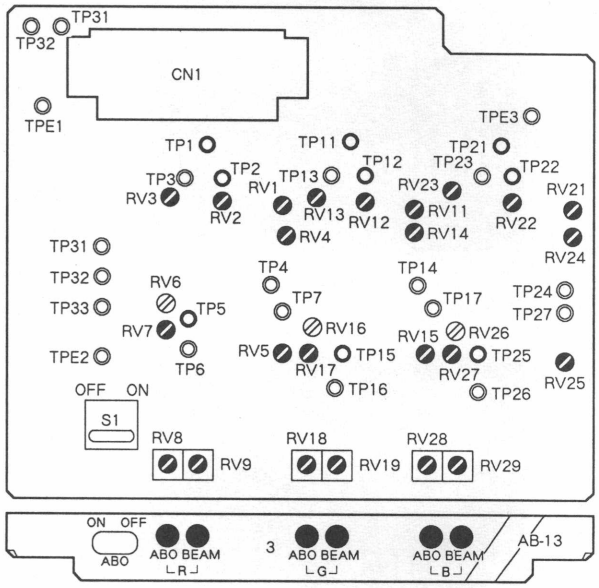
Adjust the dial so that the R WHITE and B WHITE readings are –100.

- W SHAD G WHT button/HDCO Operation panel → ON (lights up)

Adjust the dial so that the G WHITE reading is –100.

To be extended: AB-13 board

AB-13 BOARD (COMPONENT SIDE)



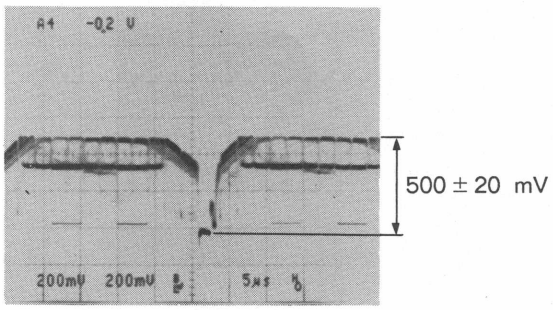
(PANEL SIDE)

Adjustment procedures

[BEAM Adjustment]

	Test point/Adjusting point : AB-13 board		
ch	BEAM SET	CLAMP	BALANCE
R	TP11: RV19	TP12: RV11	TP15: RV15
G	TP1: RV9	TP2: RV1	TP5: RV5
B	TP21: RV29	TP22: RV21	TP25: RV25

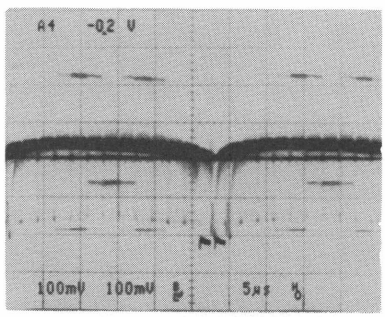
1. Shoot the HD chart.
2. Set the switch S1 (ABO)/AB-13 board to OFF.
3. Put the oscilloscope into the input mode.
4. Open the lens iris slowly and adjust RV19 (BEAM SET) so that the white level at TP11 is clipped with 500 ± 20 mV at CH-1 of the oscilloscope.



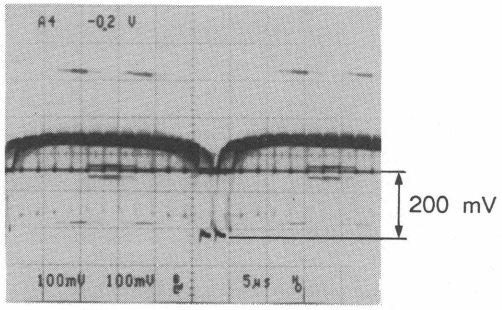
5. Carry out STEP 5-4 E FOCUS PRE-ADJUSTMENT.

6. Supply the signal at TP12 to CH-2 of the oscilloscope. Match the white levels of waveform at TP12 and TP11 with VERTICAL POSITION control on the oscilloscope. Adjust RV11 (CLAMP) so that the blanking level is 200 mV.

NG

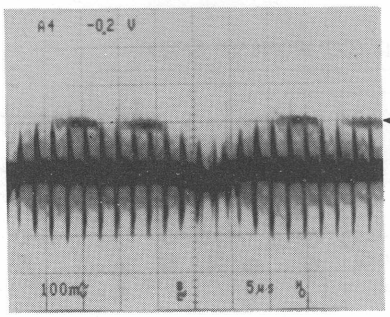


OK

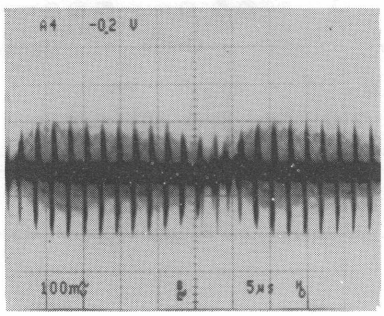


7. Adjust ⊘ RV15 (BAL) so that the portion A of the waveform at TP15 becomes flat.

NG



OK



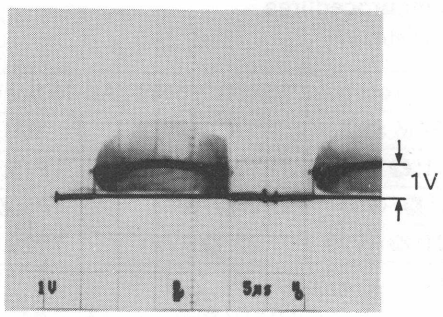
8. Perform procedures from 4 to 7 for R and B channels respectively.

[ABO Adjustment]

ch	Adjusting point/Test point : AB-13 board					
	SLOPE	KNEE	PEAK CLIP	ABO GAIN	DETAIL LEVEL	Test point
G	⊘RV12	⊘RV13	⊘RV14	⊘RV18	⊘RV17	TP11
R	⊘RV2	⊘RV3	⊘RV4	⊘RV8	⊘RV7	TP1
B	⊘RV22	⊘RV23	⊘RV24	⊘RV28	⊘RV27	TP21

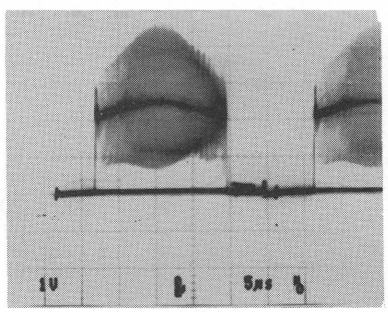
1. Set the switch S1 (ABO)/AB-13 board to ON and set the following controls as follows.
   ⊘ (SLOPE) → Mechanical center
   ⊘ (DETAIL LEVEL) → Mechanical center
   ⊘ (KNEE) → Fully clockwise ↻
   ⊘ (PEAK CLIP) → Fully clockwise ↻
   ⊘ (ABO GAIN) → Fully clockwise ↻
   When performing the following adjustments minimize the ABO and detail gains to met the specification.
2. Shoot the high-luminance pattern box PTB-500, from which the filter unit was removed, with the zoom control set to telephoto end. Keep the lens focus out of focus.
3. Open the lens iris until the level at TP11 is 1V. If there are oscillations on the waveform, adjust ⊘ RV13 (KNEE) to stop oscillations.

NG

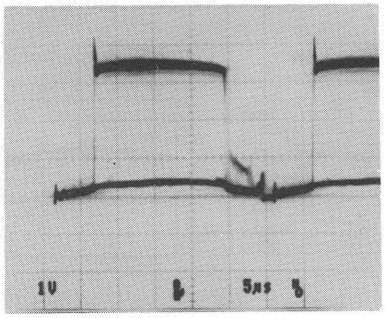


4. Adjust ⊘ RV18 (ABO GAIN) so that the beam over 2.1V appears while stopping oscillations on TP11 waveform by adjusting ⊘ RV12 (SLOPE).

NG

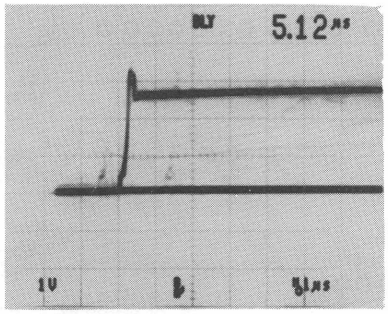


5. Adjust ⊘ RV14 (PEAK CLIP)/AB-13 board so that the signal is more than 2.1 through 3.5V.

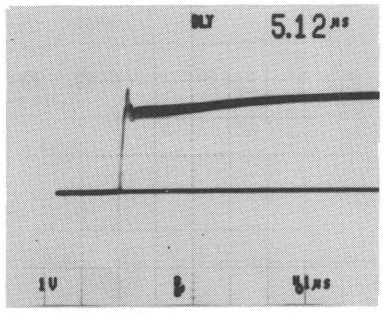


6. Adjust ⊘ RV17 (DETAIL LEVEL)/AB-13 board so that there is no luck of beam at the leading edge of the picture.

Luck of beam



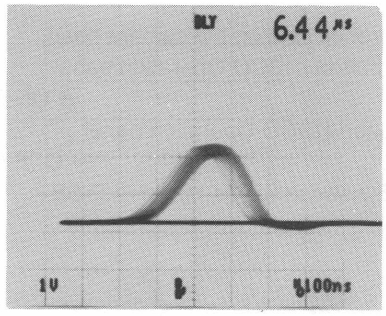
OK



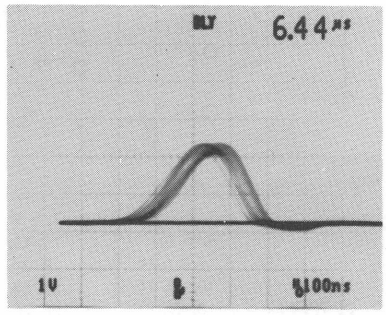
7. Perform procedures from 3 to 6 for R and B channels respectively.

8. Adjust ⊘ CV1 (FREQ ADJ)/AB-13 board so that the waveform jitter at TP-15/AB-13 board is minimized.

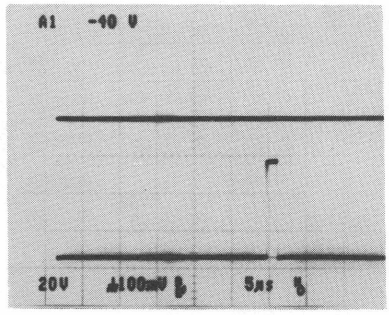
NG



OK



9. Confirm that the following waveforms at TP31, TP32 and TP33 are output.



10. Prepare the white window chart with a regular triangle hole of 5cm in length one side in the middle of the black paper. Open the lens iris and shoot the chart. Turn the zoom control and stops where the blur shown below just appears.

Perform procedure 5 again until there is no color on blur.

Note: After this adjustment is completed, set the following buttons as follows.

- MASTER GAIN button → [0] dB (lights up)
- WHT BLANKING button → OFF (goes off)
- W SHAD G WHT button → OFF (goes off)

5-11. E FOCUS ADJUSTMENT (HDC) (1/2)

Note: If the beam adjustment is performed, E focus readjustment is required.

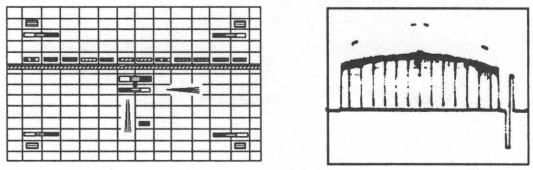
Equipment: Waveform monitor.

Preparation

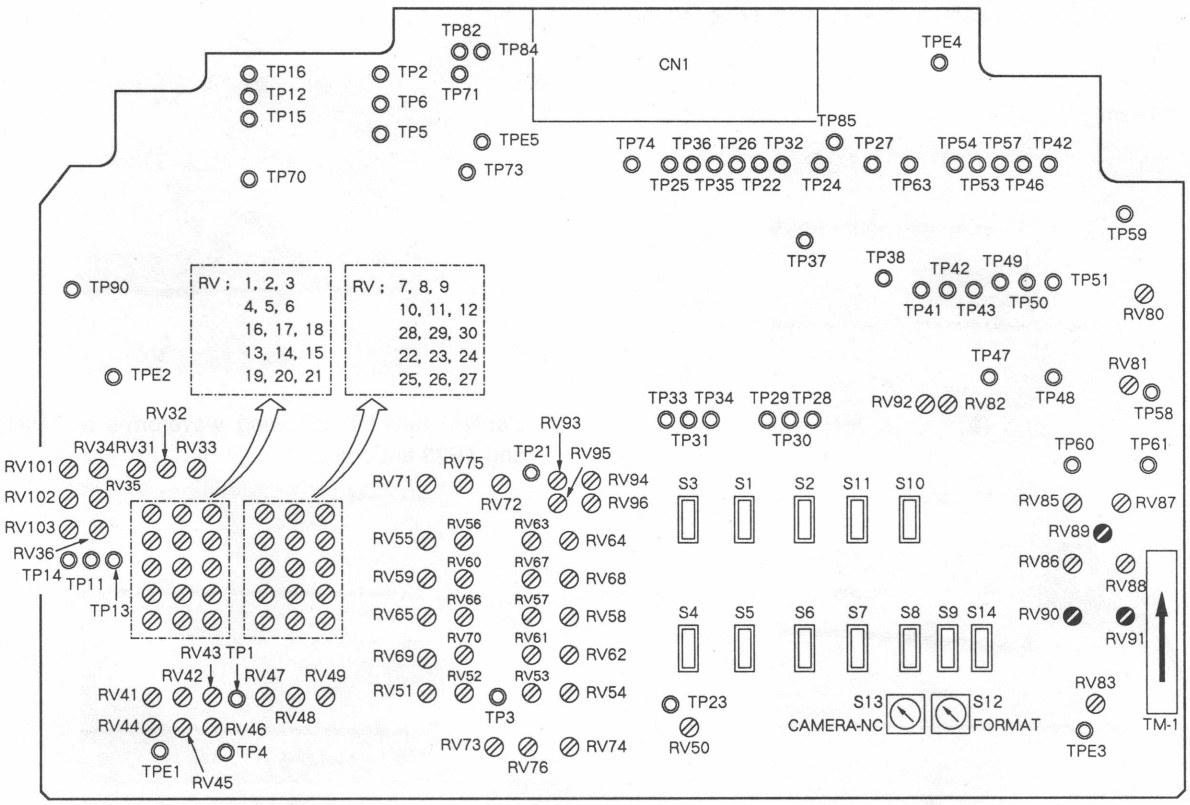
- Set the reference lens on the camera head.
- OPERATE button /HDCO Operation panel → ON (lights up)
- GAMMA button/HDCO Operation panel → OFF (lights up)
- DATA VIDEO switch/SH-34 board → P-SET

Object: Reference chart in reference lens

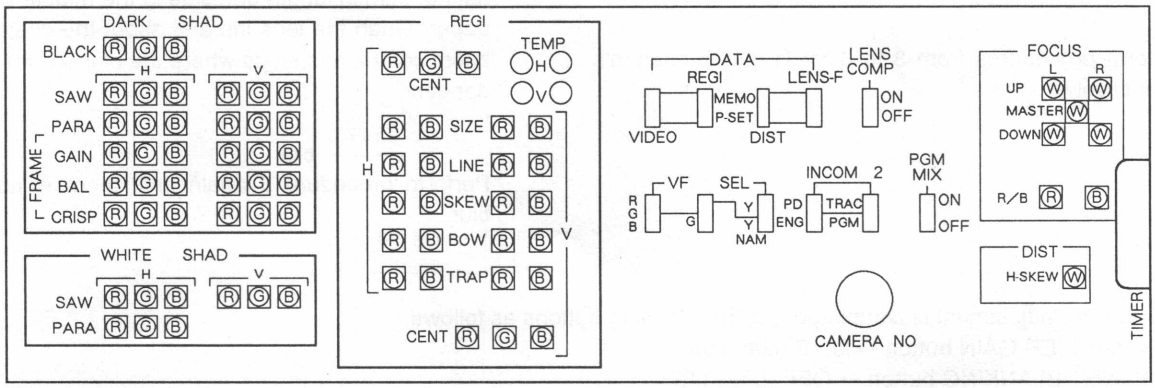
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.7 Vp-p.



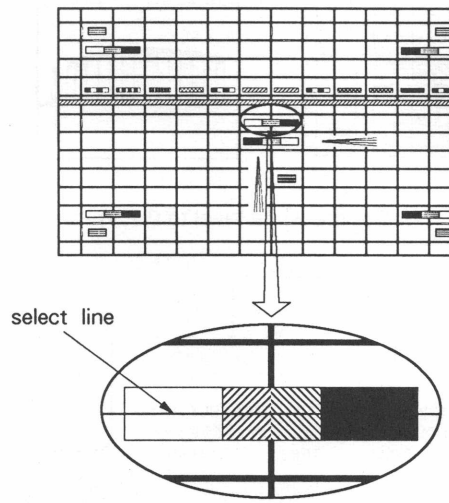
SH-34 BOARD (COMPONENT SIDE)



SH-34 COVER

Adjustment procedures

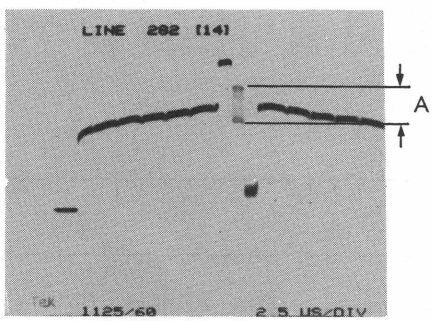
1. Set the select line on the waveform monitor as shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.



2.

WFM button setting /operation panel	Adjusting point(SH-34)
R	RV90 (R FOCUS)
G	RV89 (MASTER FOCUS)
B	RV91 (FOCUS)

Adjust each control (FOCUS) for R, G and B channels so that the level A becomes maximum.



Note: After this adjustment is completed, set the DATA VIDEO switch/SH-34 board to MEMO.

5-12. DYNAMIC FOCUS ADJUSTMENT (HDC) (1/2)

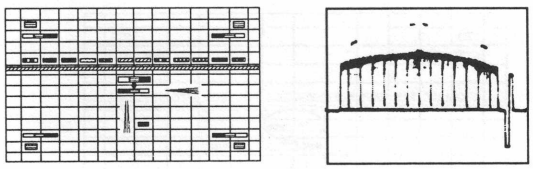
Equipment: Waveform monitor

Preparation

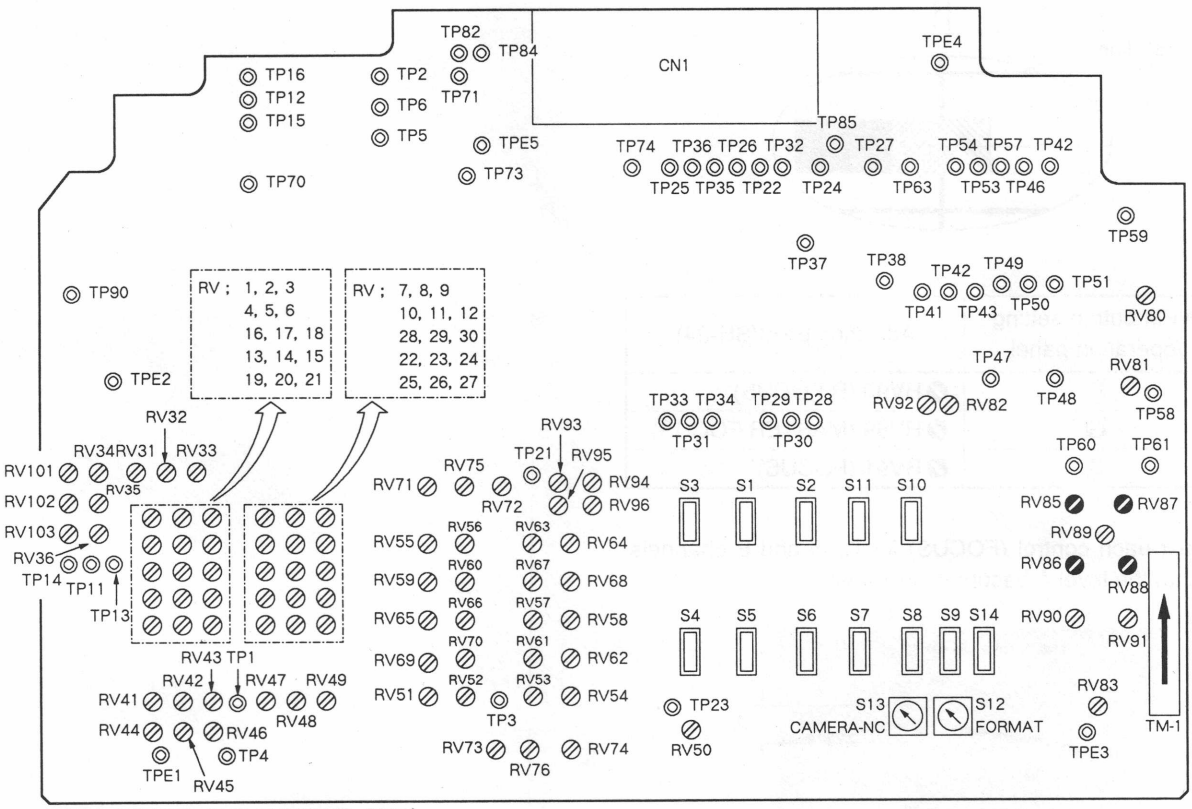
- Set the reference lens on the camera head.
- Set S100/PR-114 board to ON.

Object: Reference chart in reference lens

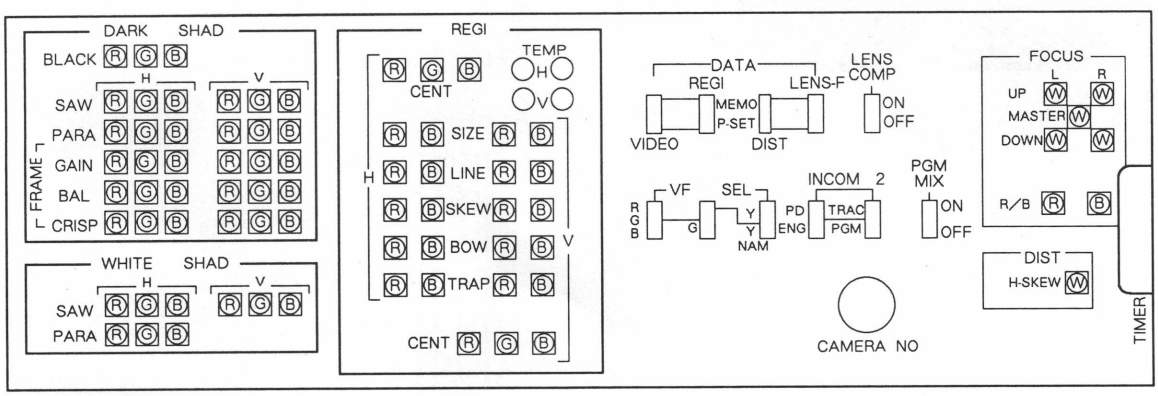
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.7 Vp-p.



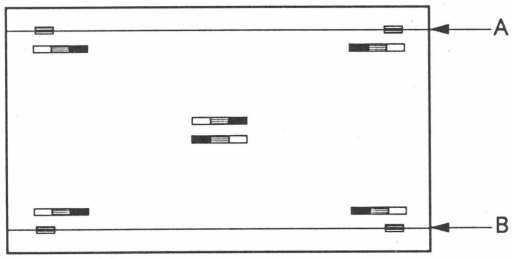
SH-34 BOARD (COMPONENT SIDE)



SH-34 COVER

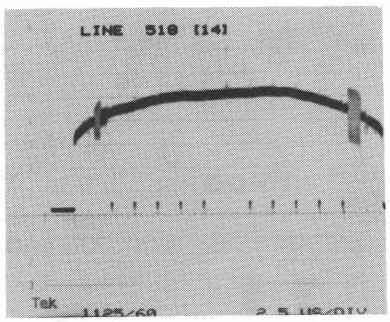
Adjustment procedures

1. Line-select the position A shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.

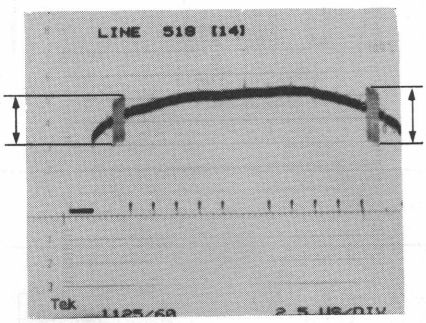


2. Adjust ⊘ RV85 (UP-L) and ⊘ RV87 (UP-R)/SH-34 board so that right and left chevron amplitudes are the same on each side.

NG

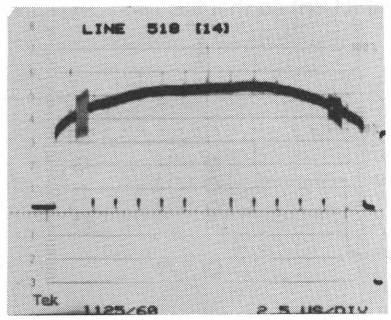


OK

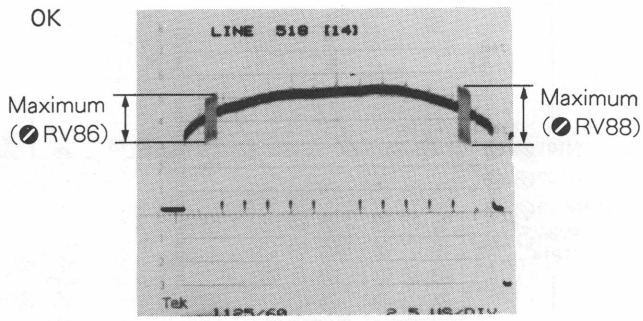


3. Line-select the position B shown in the figure. Use 14 LINE MODE of Tektronix 1730HD.
4. Adjust ⊘ RV86 (DOWN-L) and ⊘ RV88 (DOWN-R) /SH-34 board so that right and left chevron amplitudes are the same on each side.

NG



OK



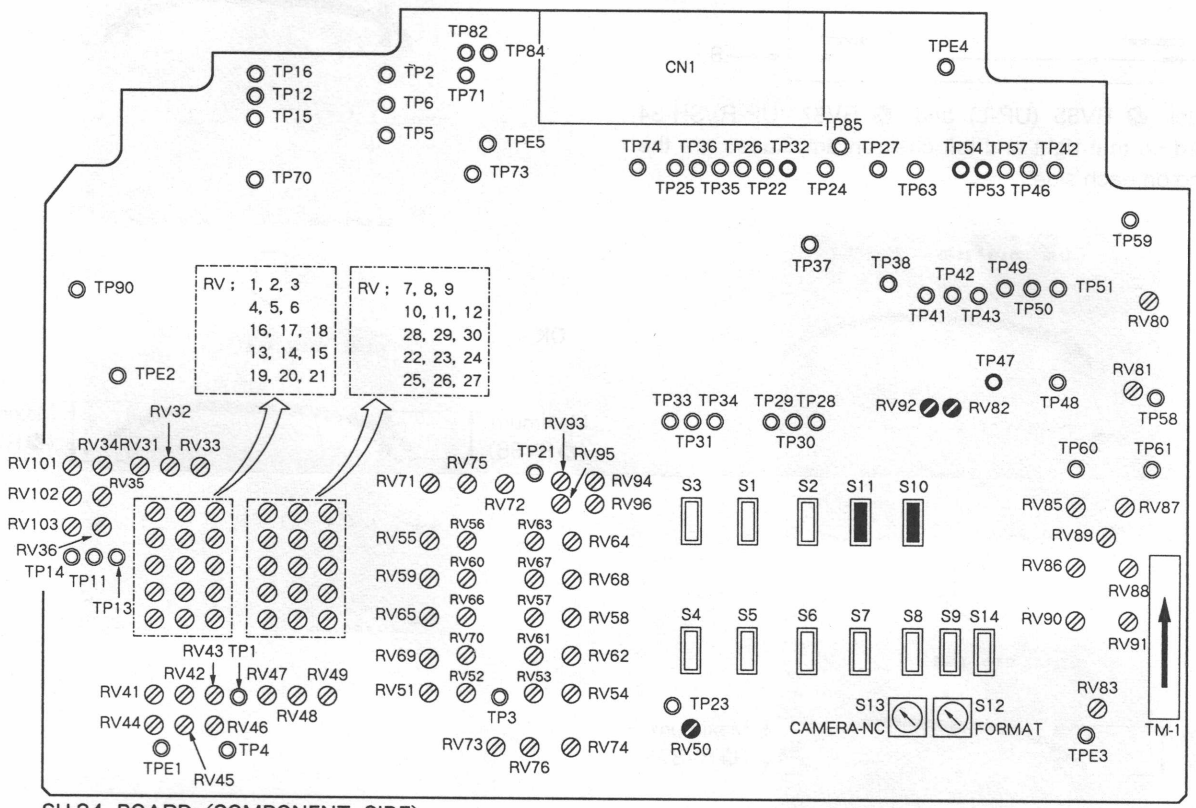
Note: After this adjustment is completed, set S100/PR-114 board to OFF.

5-13. DISTORTION GAIN ADJUSTMENT (HDC) (1/2)

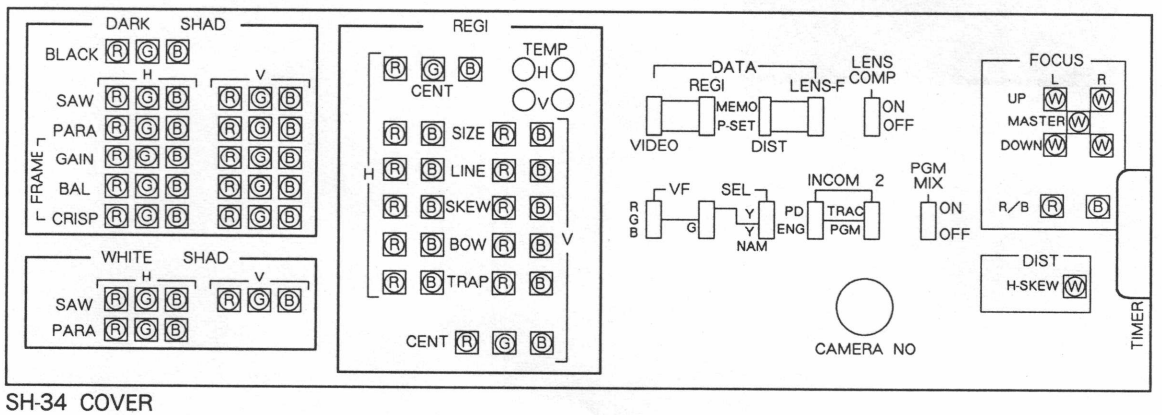
Equipment: Oscilloscope, Waveform monitor

Preparation

- Close the lens iris.
- ND FILTER button/HDCO Operation Panel → [4] (lights up)
- LENS button/HDCO Operation Panel → ON (lights up)
- Turn the dial (G-ch) so that the DISTORTION reading is 100.



SH-34 BOARD (COMPONENT SIDE)

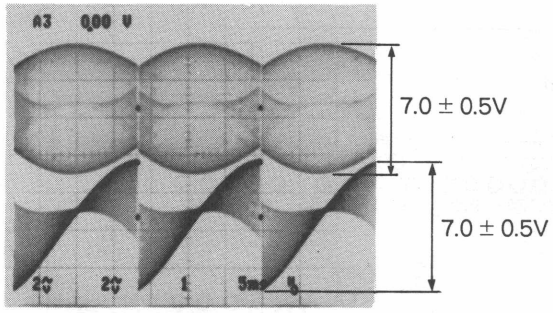


SH-34 COVER

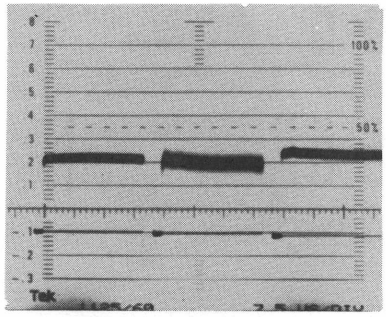
Adjustment procedures

1. Set the following switches;
   S10 (LENS COMP)/SH-34 board → OFF
   S11 (LENS F)/SH-34 board → P-SET
2.

Oscilloscope input channel	Test point (SH-34)	Adjusting point (SH-34)	Specification
CH-1	TP53 (H DIST)	⊘ RV92 (Distortion Gain)	7.0 ± 0.5V
CH-2	TP54 (V DIST)		

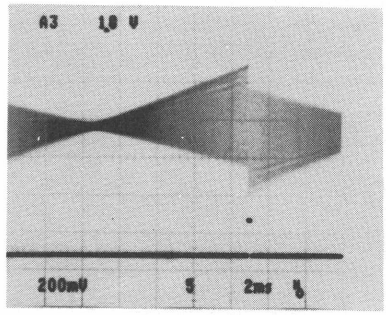


3. Observing the waveform monitor, adjust ⊘ RV82 (DISTORTION CORNER BAL)/SH-34 board so that the G-ch DC level does not change even if the G-ch dial on the HDCO Operation Panel is tuned.

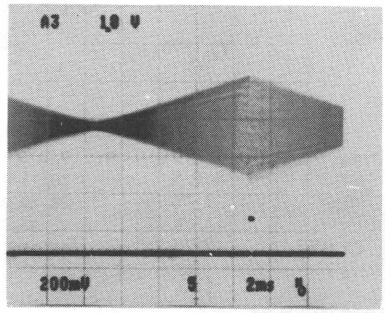


4. Adjust ⊘ RV50 (TRAP BAL) SH-34 board for the following waveform at TP23/SH-34 board.

NG



OK



5. Set the following switches as follows.
   - S10 (LENS COMP)/SH-34 board → ON
   - S11 (LENS-F)/SH-34 board → MEMO

Note: After this adjustment is completed, set the following buttons as follows.
- LENS button/HDCO Operation Panel → OFF (goes off)
- ND FILTER button/HDCO Operation Panel → [1] (lights up)

5-14. R-CH/B-CH REGISTRATION ADJUSTMENT (HDC) (1/2)

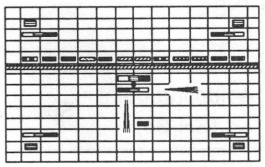
Equipment: B/W monitor

Object: Registration chart

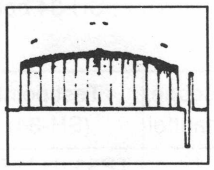
Preparation

- Set the reference lens on the camera head.

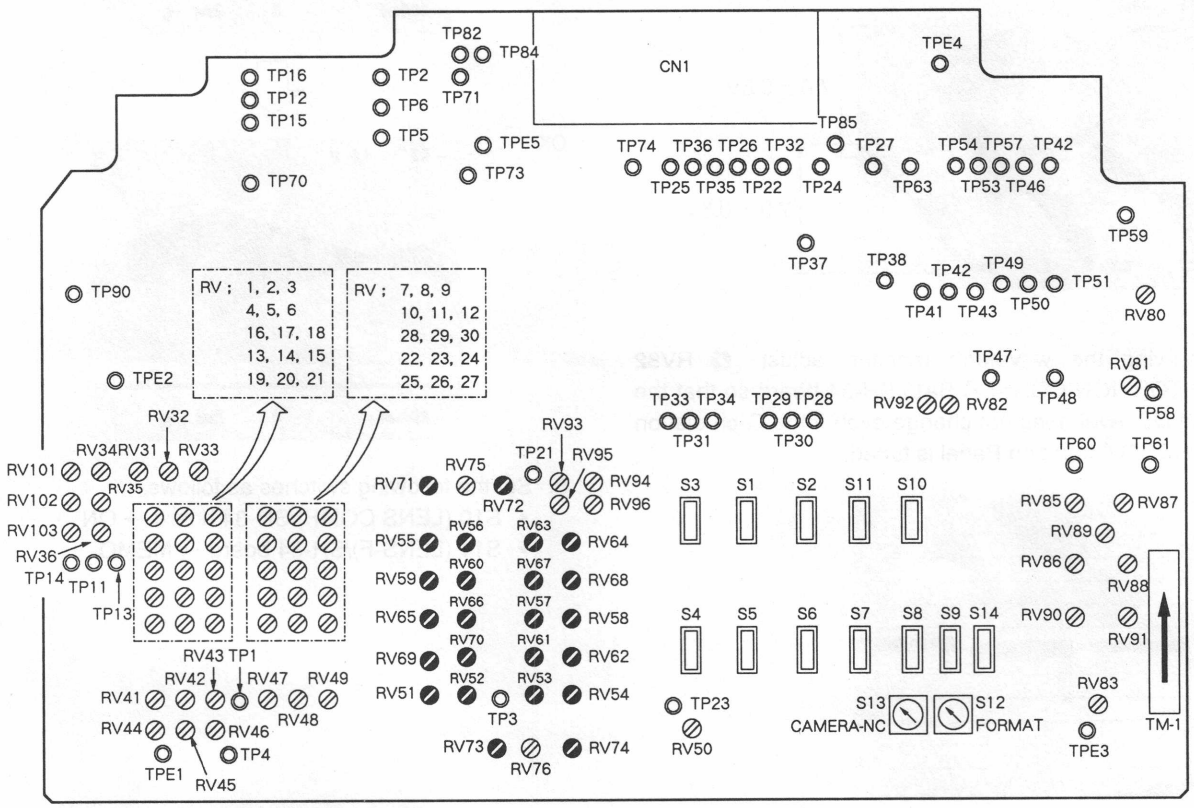
Monitor screen



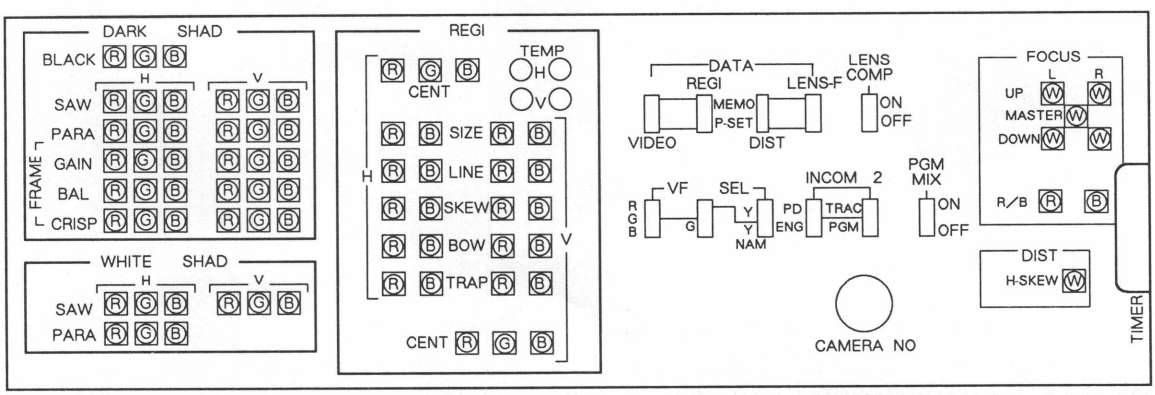
Waveform monitor



Lens iris: Set the white level to 0.7 Vp-p.



SH-34 BOARD (COMPONENT SIDE)



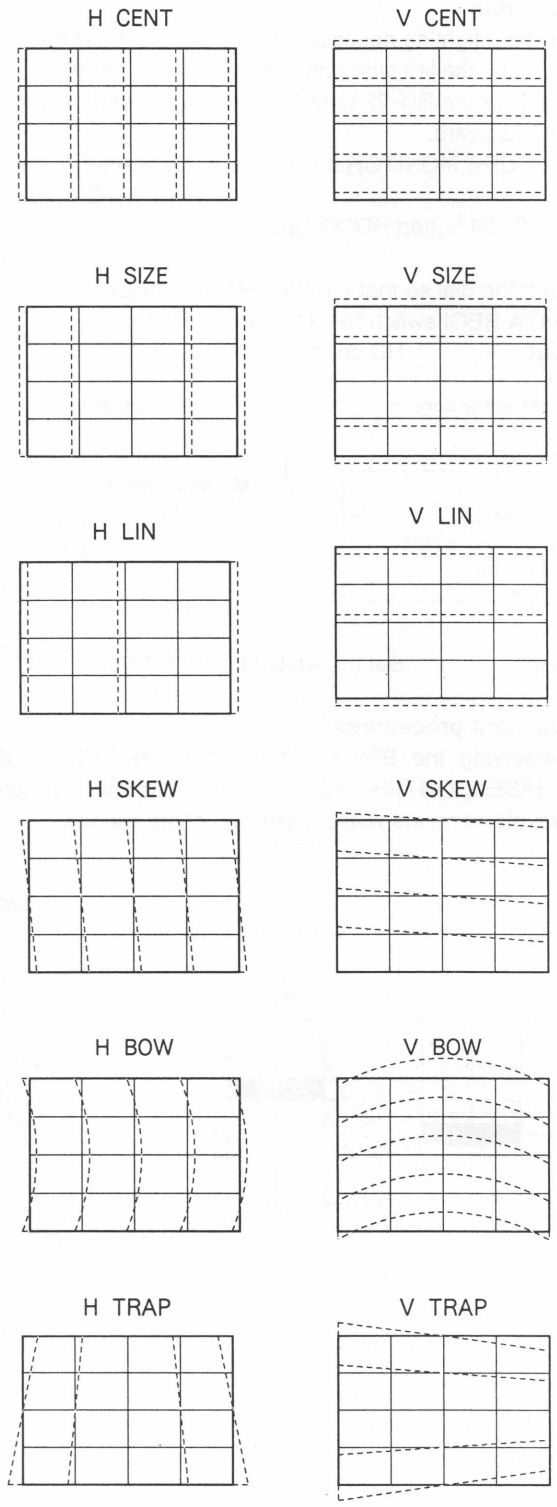
SH-34 COVER

Adjustment procedures

1. Set the switch S1 (REGI)/SH-34 board to P-SET.
2. Minimize the registration error with each controls R-ch and B-ch according to the following table.

Item	Adjusting point (SH-34)	
CHANNEL	R-ch	B-ch
PM button setting /Operation Panel	[−G], [R]	[−G], [B]
H CENT	RV71	RV72
V CENT	RV73	RV74
H SIZE	RV55	RV56
V SIZE	RV63	RV64
H LINE	RV59	RV60
V LINE	RV67	RV68
H SKEW	RV65	RV66
V SKEW	RV57	RV58
H BOW	RV69	RV70
V BOW	RV61	RV62
H TRAP	RV51	RV52
V TRAP	RV53	RV54

3. Set the switch S1 (REGI)/SH-34 board to MEMO.



Note: When REGI errors are concentrated in a area on the monitor screen, DRC range can be exceeded, resulting in error message and failure to complete registration.
Adjust the above controls so that REGI errors are distributed around the picture.

5-15. HORIZONTAL PULSE TIMING ADJUSTMENT (HDC)

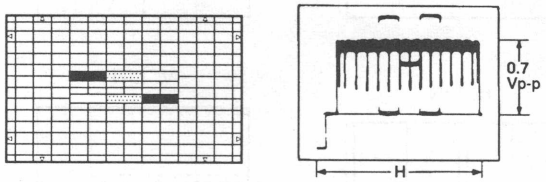
Equipment: B/W monitor

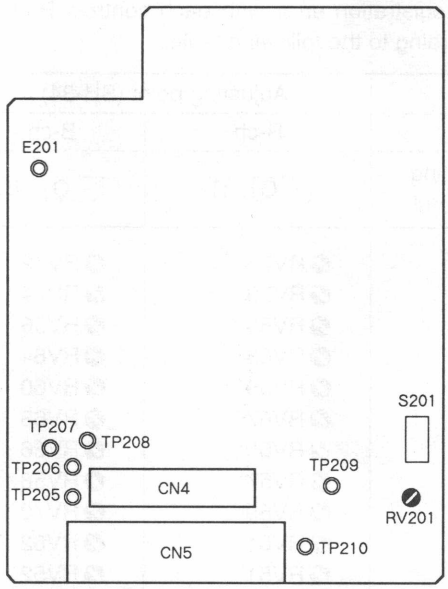
Preparation

- Prepare lighting necessary to illuminate a test chart.
- Remove the left side panel of the camera head. Remove the RG-22 board and connect it vertically to the IF-213 board.
- PICTURE MONITOR button/HDCO Operation Panel → R, G (lights up)
- RD-REGI button/HDCO Operation Panel → ON (lights up)
- Turn the dial so that the V CORRECT reading is 100.
- DATA REGI switch/SH-34 board → MEMO.

Object: HD chart

Monitor screen **Waveform monitor**





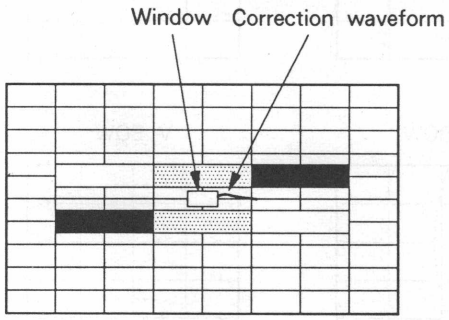
RG-22 BOARD (COMPONENT SIDE)

Lens iris: Set the white level to 0.7 Vp-p.

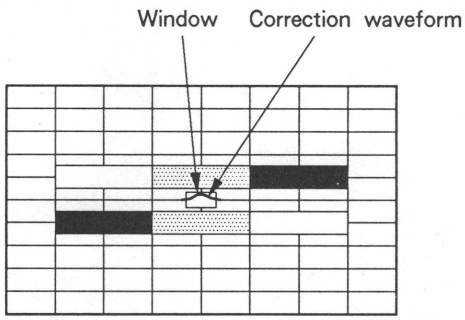
Adjustment procedures

- Observing the B/W monitor, adjust RV201 (DRC PHASE CONT)/RG-22 board so that the correction waveform meets with the position of the window.

NG



OK



Note:

- Return the RG-22 board to its normal position. Attach the left side panel.
- PICTURE MONITOR button/HDCO Operation Panel → Y (lights up)
- RD-REGI button/HDCO Operation Panel → OFF (goes off)
- DATA REGI switch/SH-34 board → P-SET

STEP 6. VIDEO SIGNAL SYSTEM ADJUSTMENT

6-1. VIDEO SIGNAL INPUT CHECK (HDC)

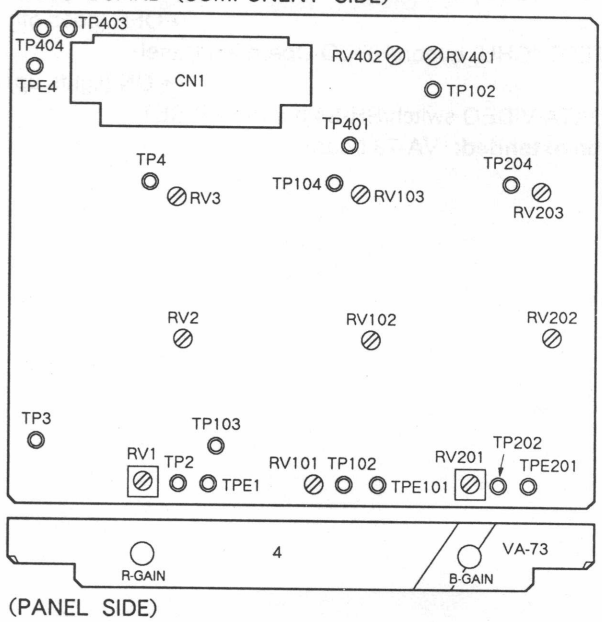
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel → ON (lights up)
- DATA VIDEO switch/SH-34 board → P-SET

To be extended: VA-73 board

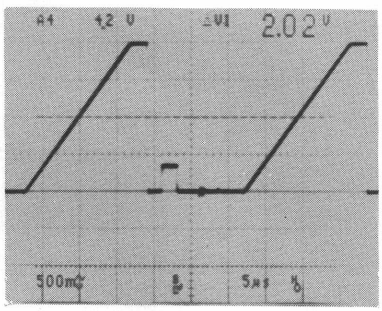
VA-73 BOARD (COMPONENT SIDE)



(PANEL SIDE)

Test point: A19 (CN1)/VA-73 board

Specification: Video signal shown below should be input.



6-2. VIDEO SIGNAL LEVEL ADJUSTMENT (HDC)

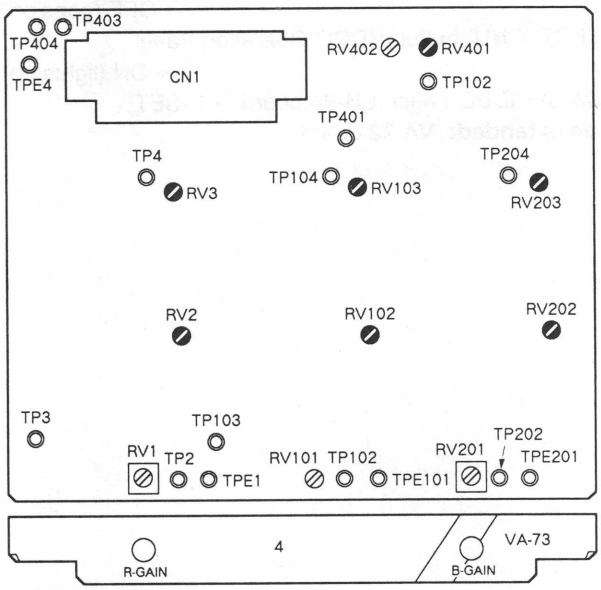
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel → ON (lights up)
- DATA VIDEO switch/SH-34 board → P-SET

To be extended: VA-73 board

VA-73 BOARD (COMPONENT SIDE)



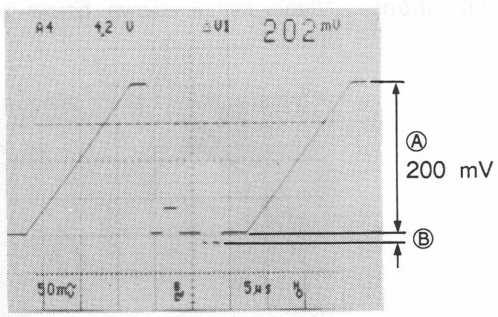
(PANEL SIDE)

Adjustment procedures

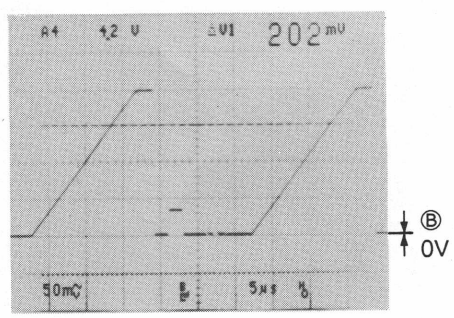
1. Adjust ◐ RV401 (0 dB SET)/VA-73 board so that the level at TP402/VA-73 board is –0.8V.
2.

ch	Test point (VA-73)	Adjusting point (VA-73)	Specification
R	TP4	◐ RV2 (R BLACK)	Ⓑ=0V
		◐ RV3(R-GAIN-2)	Ⓐ=200 mV
G	TP104	◐ RV102 (G BLACK)	Ⓑ=0V
		◐ RV103 (G-GAIN-2)	Ⓐ=200 mV
B	TP204	◐ RV202 (B BLACK)	Ⓑ=0V
		◐ RV203 (B-GAIN-2)	Ⓐ=200mV

NG



OK



Note: After this adjustment is completed, set the DATA VIDEO switch/SH-34 board to MEMO.

6-3. VDA-14 BOARD INPUT CHECK (HDC)

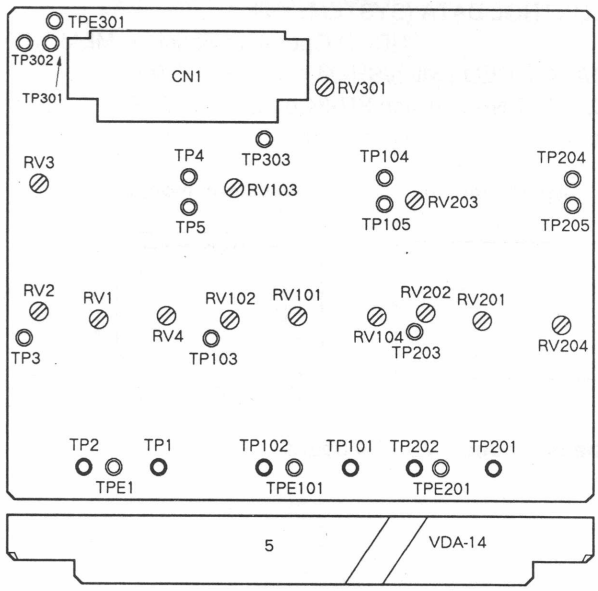
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- MASTER GAIN button/HDCO Operation Panel
  → 0 dB (lights up)

To be extended: VDA-14 board

VDA-14 BOARD (COMPONENT SIDE)

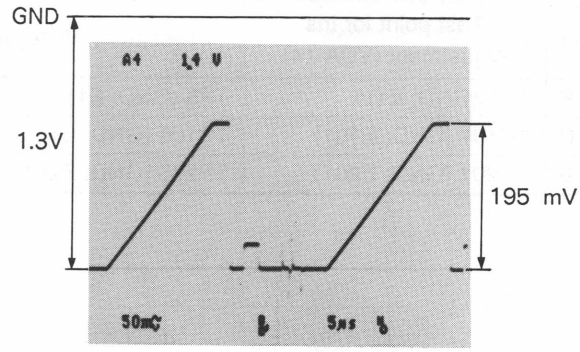


(PANEL SIDE)

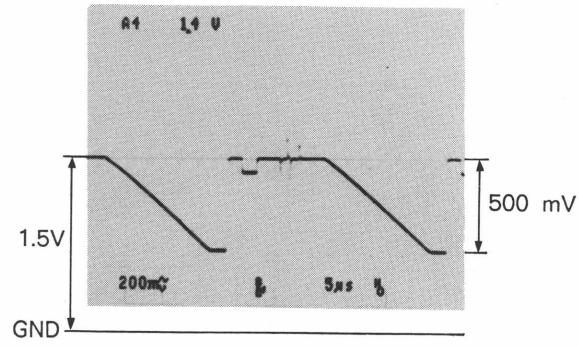
Adjustment procedures

ch	Test point (VDA-14)	Waveform check
R	TP1	Ⓐ
G	TP101	
B	TP201	
R	TP2	Ⓑ
G	TP102	
B	TP202	

Waveform Ⓐ



Waveform Ⓑ



6-4. FLARE ADJUSTMENT (HDC) (1/2)

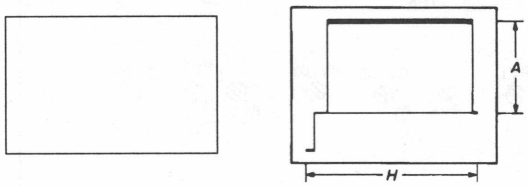
Equipment: Oscilloscope

Preparation

- FLARE button/HDCO Operation Panel → ON (lights up)
- CONTROL DATA (SYSTEM) switch /HDCO Operation Panel → MEMORY
- DATA VIDEO switch/SH-34 board → MEMO
- DATA LENS-F switch/SH-34 board → P-SET

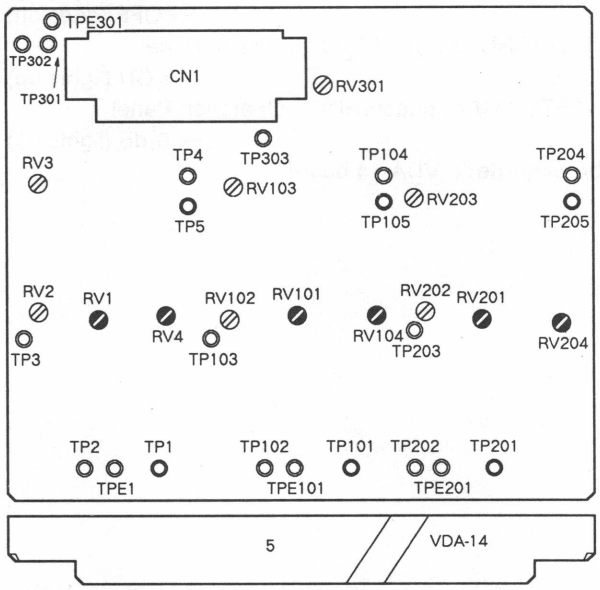
Object: White pattern

Monitor screen **Waveform monitor**



To be extended: VDA-14 board

VDA-14 BOARD (COMPONENT SIDE)



VDA-14 BOARD (PANEL SIDE)

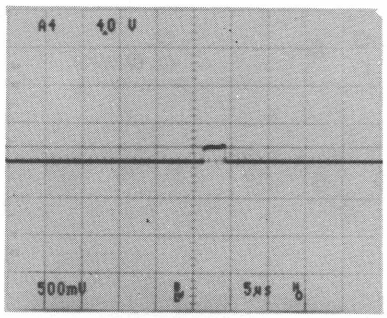
Adjustment procedures

ch	Test point for Iris Adjustment (VDA-14)	Test point (VDA-14)	Adjusting point (VDA-14)	
			FLARE BAL	FLARE LEVEL
R	TP1 (GND; E1)	TP5 (GND; E1)	RV4	RV1
G	TP101 (GND; E101)	TP105 (GND; E101)	RV104	RV101
B	TP201 (GND; E201)	TP205 (GND; E201)	RV204	RV201

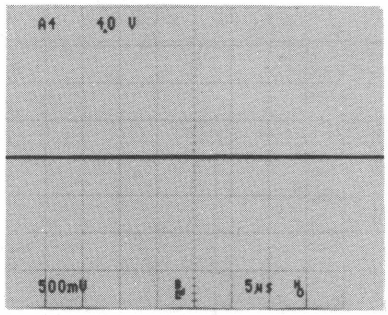
[R-CH]

1. Close the lens iris and turn the adjustment dial (R FLARE)/HDCO Operation Panel to set the flare value to –100.
2. Adjust ⊘ RV4 (R FLARE BAL) so that the waveform at TP1 is flat.

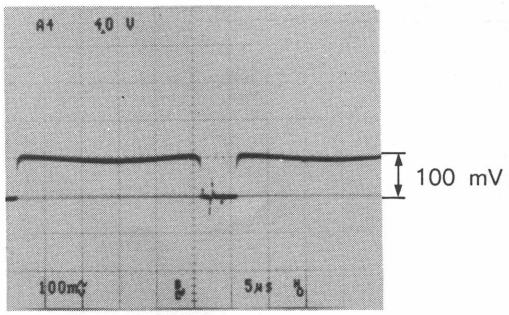
NG



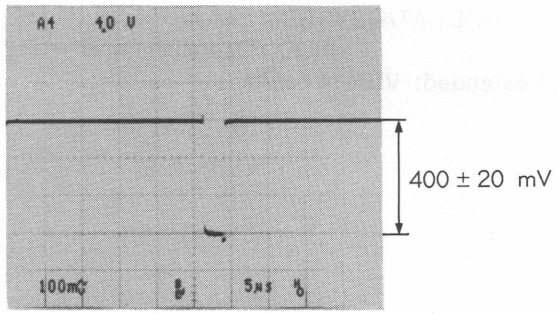
OK



3. Turn the adjustment dial (R FLARE)/HDCO Operation Panel to set the flare value to 0. Adjust the iris control so that the level at TP1 is 100 mV.



4. Turn the adjustment dial (R FLARE) 3/HDCO Operation Panel to set the flare value to 100.
5. Adjust ⊘ RV1 (FLARE LEVEL) so that the level at TP5 is 400 ± 20 mVp-p.



6. Adjust G-ch/B-ch in the same manner.

Note: After this adjustment is completed, set the following switches as follows.

- FLARE button/HDCO Operation Panel → OFF (goes off)
- CONTROL DATA (SYSTEM) switch/HDCO Operation Panel → PRESET
- DATA VIDEO switch/SH-34 board → P-SET
- DATA LENS-F switch/SH-34 board → MEMO

6-5. VDA-14 BOARD OUTPUT LEVEL ADJUSTMENT (HDC)

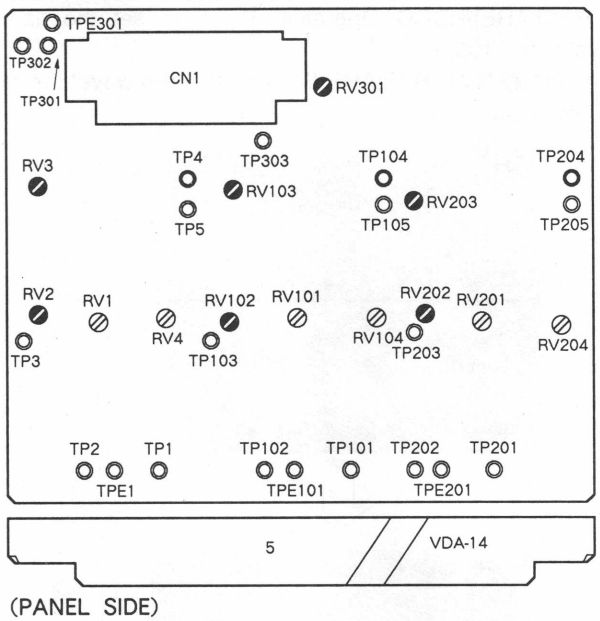
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel → ON (lights up)
- CONTROL DATA (SYSTEM) switch /HDCO Operation Panel → P-SET

To be extended: VDA-14 board

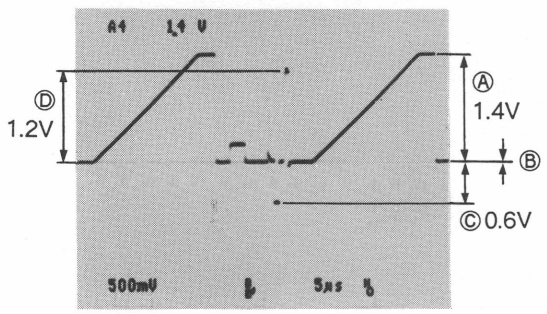
VDA-14 BOARD (COMPONENT SIDE)



(PANEL SIDE)

Adjustment procedures

ch	Test point (VDA-14)	Adjusting point (VDA-14) Ⓐ	Ⓑ	Ⓒ	Ⓓ	Specification
R	TP4	RV2 (R-GAIN ADJ)	RV3 (R-DC SET)	Checking	Checking	Ⓐ=1.4V Ⓑ=0V Ⓒ=1.6V Ⓓ=1.2V
G	TP104	RV102 (G-GAIN ADJ)	RV103 (G-DC SET)	RV301 (SYNC LEVEL)		
B	TP204	RV202 (B-GAIN ADJ)	RV203 (B-DC SET)	Checking		



Note: Because the command signal is superimposed to portion Ⓓ only for B-ch, no pulse may appear at portion Ⓓ.

6-6. TEST BLACK ADJUSTMENT (HDC)

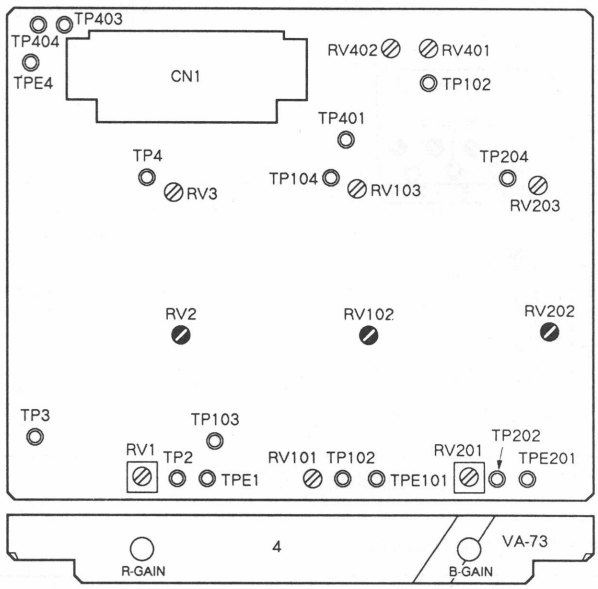
Equipment: Waveform monitor

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)

To be extended: VA-73 board

VA-73 BOARD (COMPONENT SIDE)



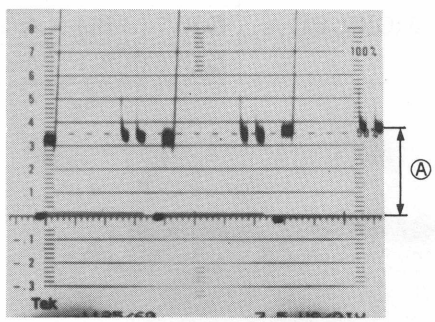
(PANEL SIDE)

Adjustment procedures

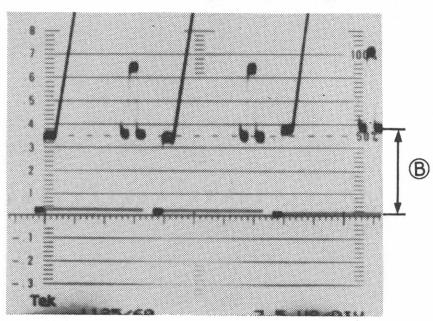
- Adjust the following controls in sequence so that the black pedestal level does not change even when the [+6] dB or [–6] dB MASTER GAIN buttons are pressed alternately.

ch	Adjusting point (VA-73)	Specification
R	RV2 (R BLACK)	Ⓐ=Ⓑ
G	RV102 (G BLACK)	
B	RV202 (B BLACK)	

+ 6 dB



– 6 dB



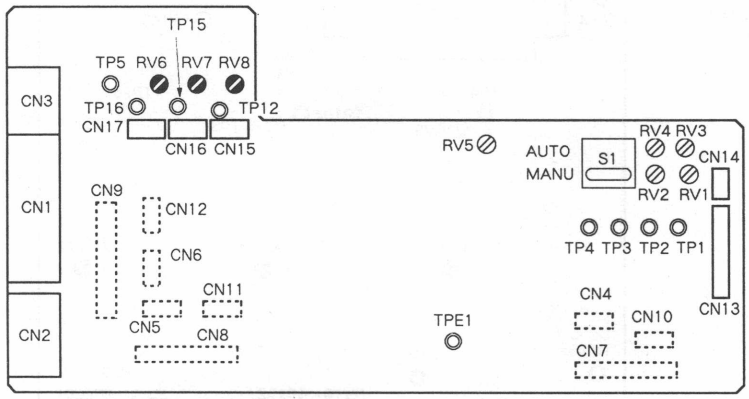
Note: After this adjustment is completed, pressu [0] dB MASTER GAIN button/HDCO operation panel.

6-7. BIAS LIGHT ADJUSTMENT (HDC)

Equipment: Oscilloscope

Preparation

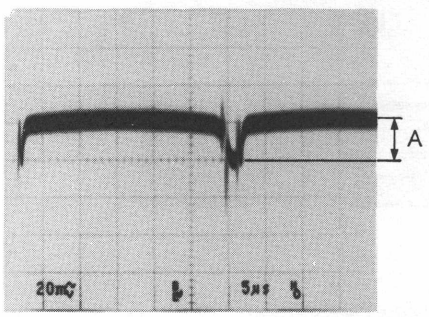
- ND FILTER button/HDCO Operation Panel
  → [4] (lights up)



SV-107 BOARD (COMPONENT SIDE)

Adjustment procedures

ch	Test point (PA-80)	Adjusting point (SV-107)	Specification
R	TP2 (GND; E1)	RV8 (R-BL)	A=15 ± 5 mV
G		RV7 (G-BL)	A=20 ± 5 mV
B		RV6 (B-BL)	A=25 ± 5 mV

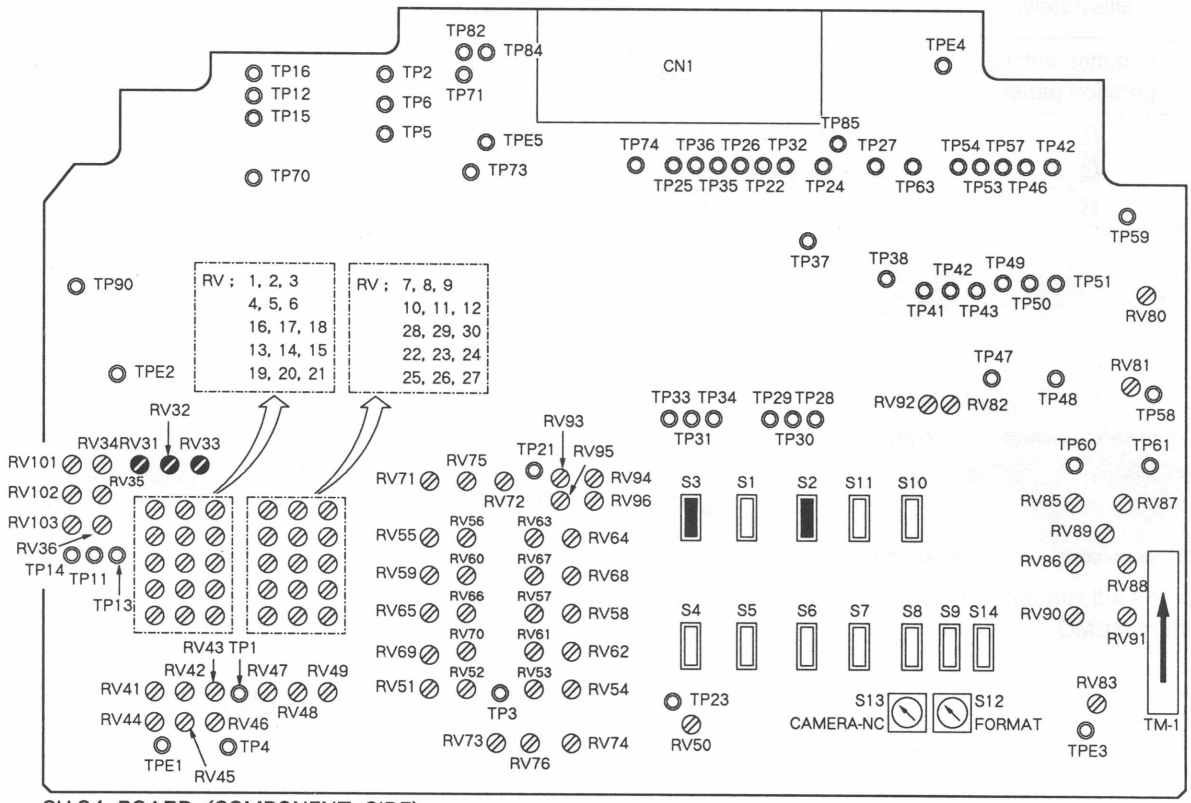


6-8. BLACK LEVEL ADJUSTMENT (HDC) (1/2)

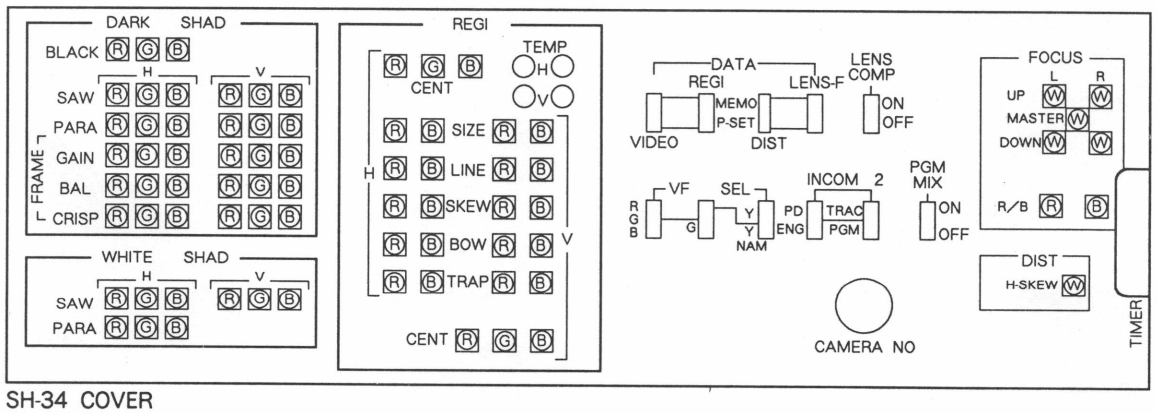
Equipment: Waveform monitor

Preparation

- ND FILTER button/HDCO Operation Panel
  → [4] (lights up)
- GAMMA FIX button/HDCO Operation Panel
  → ON (lights up)



SH-34 BOARD (COMPONENT SIDE)

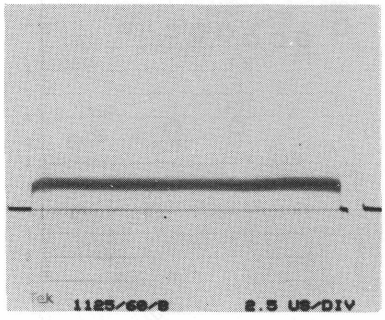


SH-34 COVER

Adjustment procedures

1. Set the switches S2 (DATA DIST) and S3 (DATA VIDEO)/SH-34 board to P-SET.
2. Observing the waveform monitor, adjust the following control (H-BLACK) so that the pedestal level for each channel does not change even when the [–6] dB, [–3] dB, [0] dB, [+3] dB and [+6] dB MASTER GAIN buttons are pressed alternately.

WFM button setting /operation panel	Adjusting point (SH-34)
[R]	RV31 (R H-BLACK)
[G]	RV32 (G H-BLACK)
[B]	RV33 (B H-BLACK)



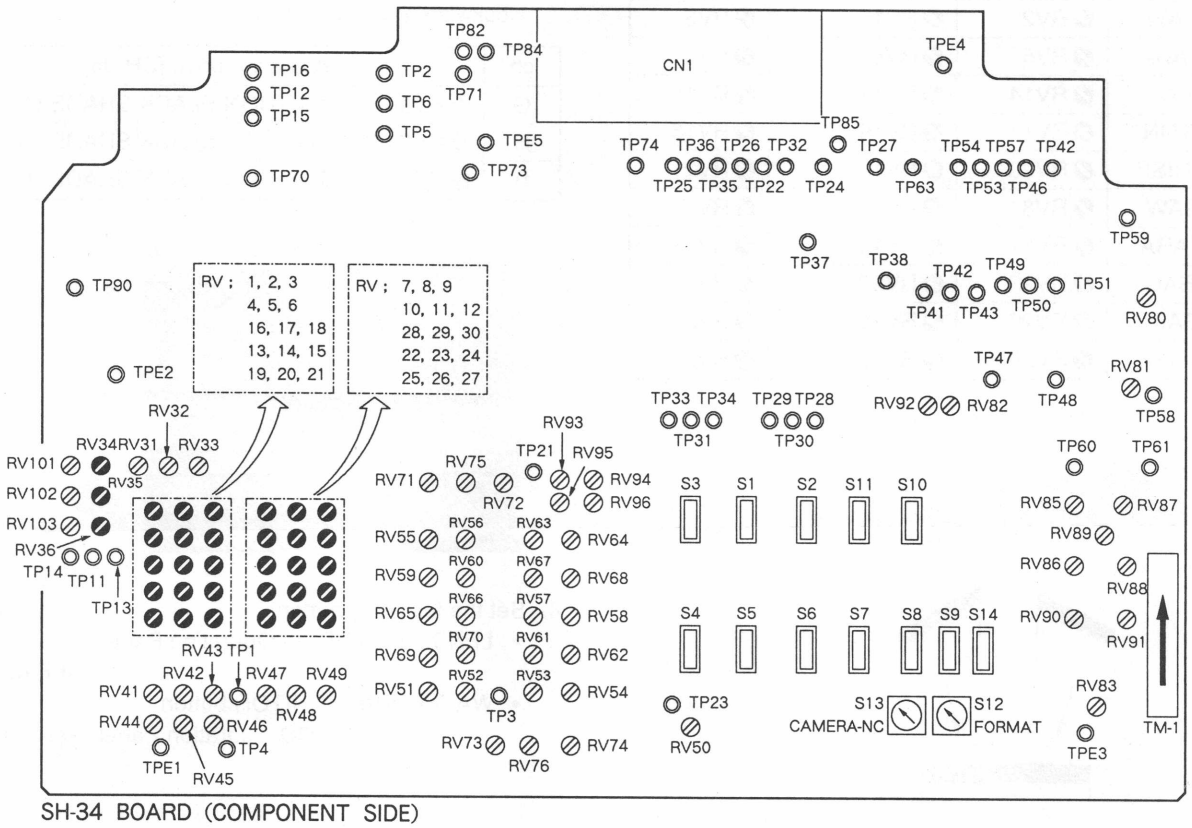
3. After this adjustment, set the switches S2 and S3/SH-34 board to MEMO.

6-9. BLACK SHADING ADJUSTMENT (HDC) (1/2)

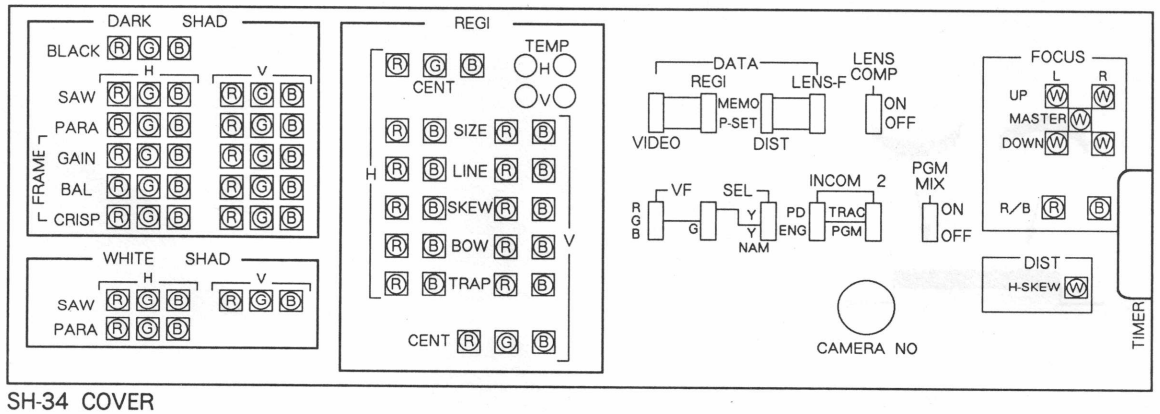
Equipment: Waveform monitor

Preparation

- ND FILTER button/HDCO Operation Panel
  → [4] (lights up)
- MASTER GAIN button/HDCO Operation Panel
  → [+6] dB (lights up)



SH-34 BOARD (COMPONENT SIDE)



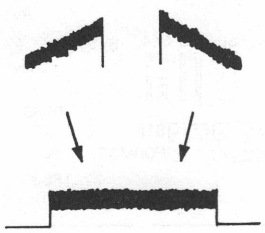
SH-34 COVER

Adjustment procedures

1. Select PICTURE MONITOR button/HDCO Operation Panel and perform adjustments for each channel of G, R and B so that the waveform is flat.

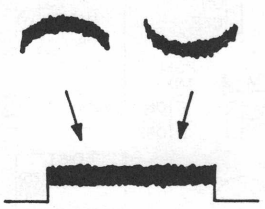
Item	Adjusting point (SH-34)		
	G-ch	R-ch	B-ch
H SAW	RV2	RV1	RV3
H PARA	RV5	RV4	RV6
H BAL	RV14	RV13	RV15
H GAIN	RV17	RV16	RV18
H CRISP	RV20	RV19	RV21
V SAW	RV8	RV7	RV9
V PARA	RV11	RV10	RV12
V BAL	RV23	RV22	RV24
V GAIN	RV29	RV28	RV30
V CLISP	RV26	RV25	RV27

NG



OK

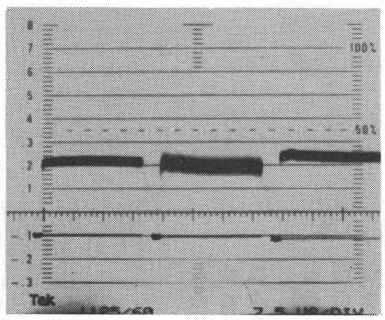
NG



OK

2. Press the LENS button and WAVEFORM MONITOR buttons of [R], [G] and [B] on the HDCO Operation Panel. (These buttons will light up.)
3. Adjust the following controls (DISTORTION BLACK SHADE) so that the black level does not change even when the dial/HDCO Operation Panel is turned clockwise or counterclockwise.

ch	Adjusting point (SH-34)
G	RV36 (DISTORTION BLACK SHADE G)
R	RV34 (DISTORTION BLACK SHADE R)
B	RV35 (DISTORTION BLACK SHADE B)



4. Set the following buttons.
   - LENS button/HDCO Operation Panel → OFF (goes off)
   - WAVEFORM MONITOR button /HDCO Operation Panel → [Y] (lights up)

Note: After this adjustment is completed, press the [0] dB MASTER GAIN button/HDCO Operation Panel.

6-10. VIDEO INPUT GAIN ADJUSTMENT (HDC)

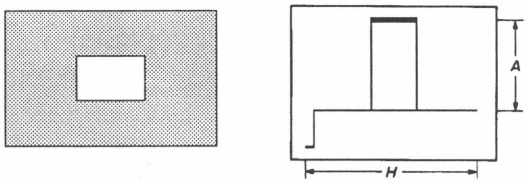
Equipment: Oscilloscope

Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)
- ND FILTER button/HDCO Operation Panel → [1] (lights up)

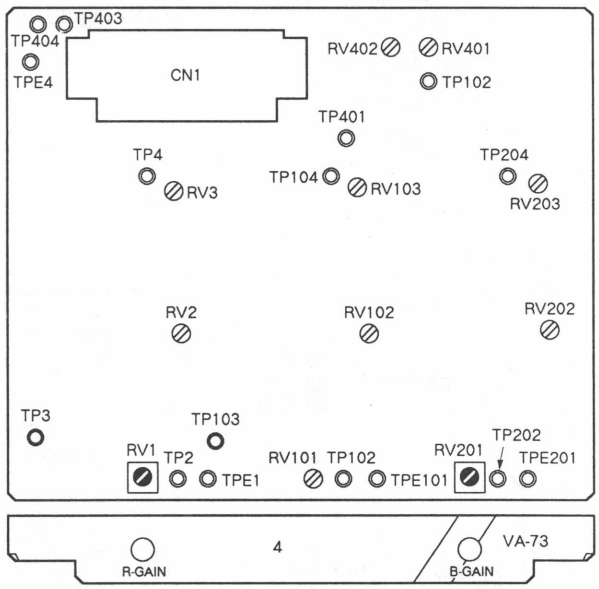
Object: White window chart

Monitor screen **Waveform monitor**



To be extended: VA-73 board

VA-73 BOARD (COMPONENT SIDE)

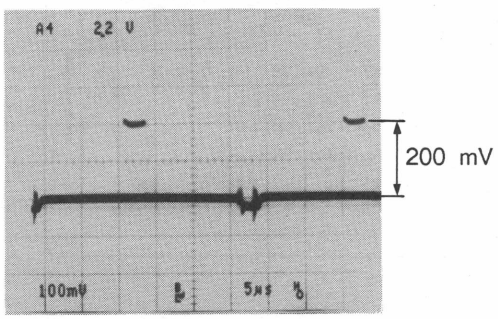


(PANEL SIDE)

Adjustment procedures

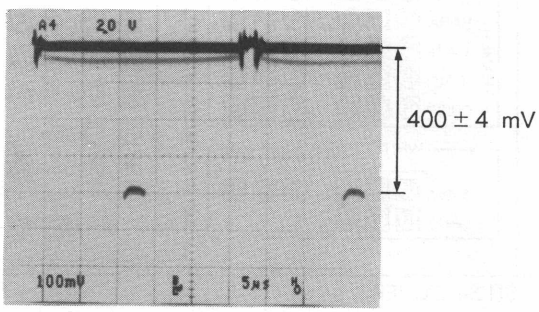
1. Adjust the iris control so that the level (G-ch) at TP2 is 200 mV.

TP2/PA-80 (G-ch)



2. Adjust the following controls (GAIN 1) with the iris control set in above procedure.

ch	Test point (VA-73)	Adjusting point (VA-73)	Specification
G	TP103 (GND; E101)	RV101 (G-GAIN 1)	400 ± 4mV
R	TP3 (GND; E1)	RV1 (R-GAIN 1)	
B	TP203 (GND; E201)	RV201 (B-GAIN 1)	



6-11. WHITE SHADING ADJUSTMENT (HDC)

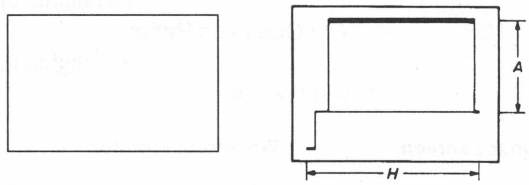
Equipment: Waveform monitor

Object: White pattern

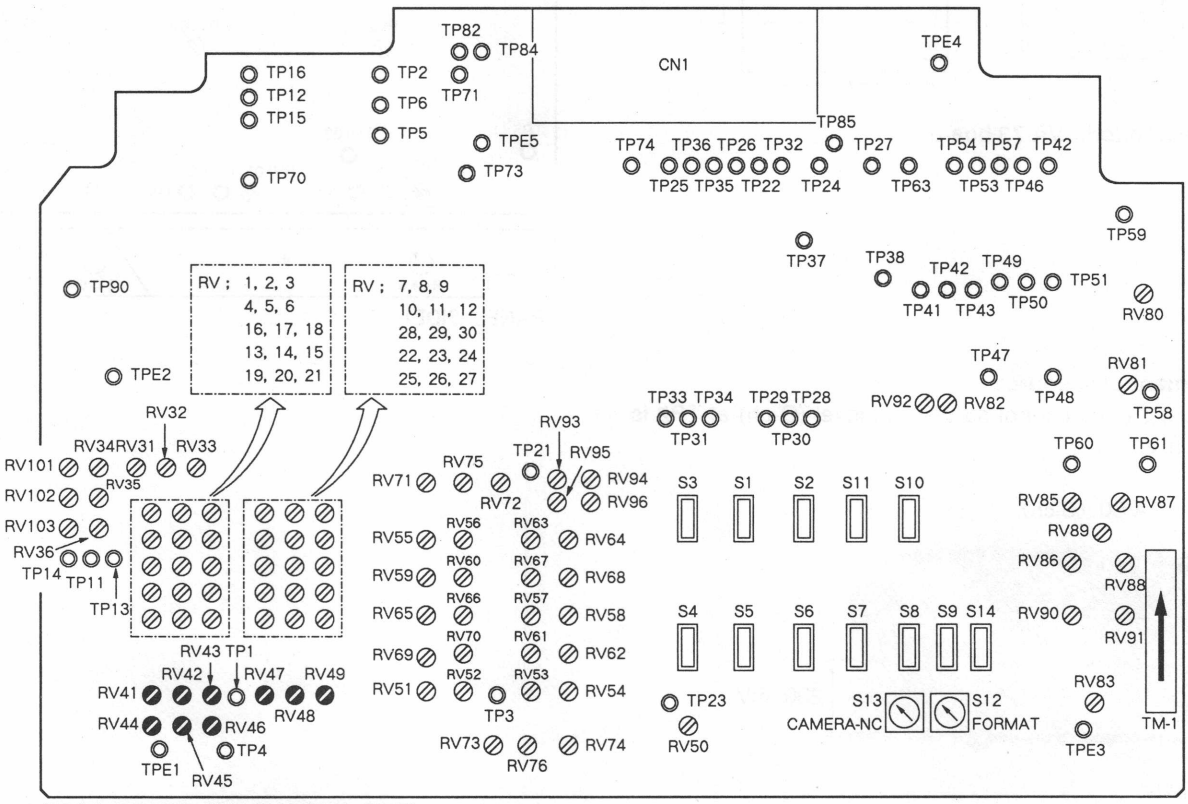
Preparation

- OPERATE button/HDCO Operation Panel
  → ON (lights up)

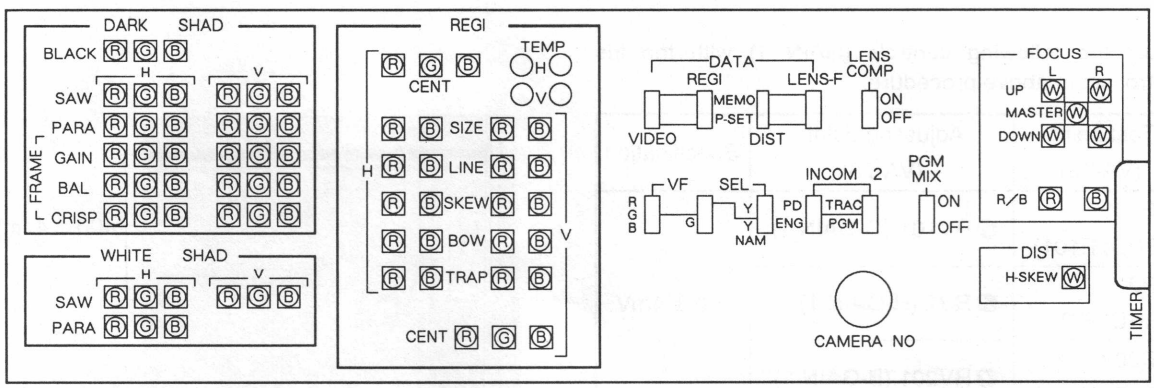
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.5 Vp-p.



SH-34 BOARD (COMPONENT SIDE)



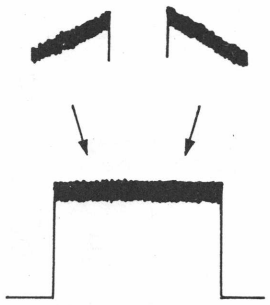
SH-34 COVER

Adjustment procedures

1. Set the switches S2 (DATA SET) and S3 (DATA VIDEO)/SH-34 board to P-SET.
2. Observing the waveform monitor, perform the following adjustments for each channel of G, R and B by selecting the WAVEFORM MONITOR buttons of [G], [R] and [B] is sequence.

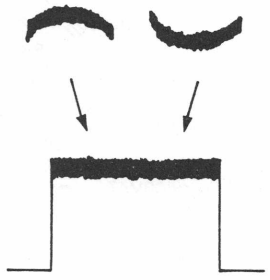
Item	Adjusting point (SH-34)		
	G-ch	R-ch	B-ch
H SAW	⊘RV42	⊘RV41	⊘RV43
V SAW	⊘RV48	⊘RV47	⊘RV49
H PARA	⊘RV45	⊘RV44	⊘RV46

NG



OK

NG



OK

6-12. WHITE SHADING ADJUSTMENT WITH DISTORTION (HDC) (1/2)

Note: This adjustment is applicable to the units with serial No. 10201 and higher.

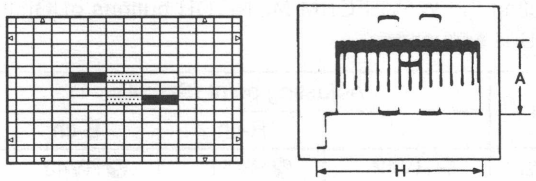
Equipment: Waveform monitor

Object: HD chart

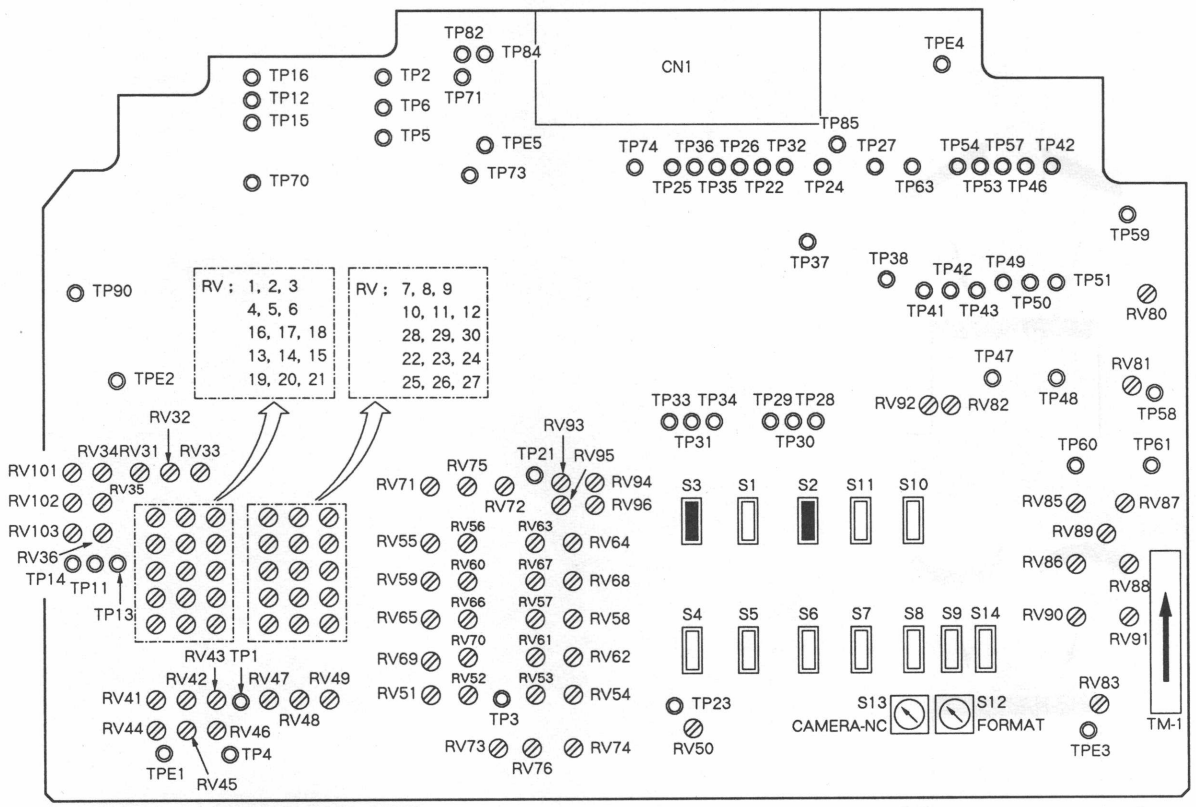
Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)
- LENS button/HDCO Operation Panel → ON (lights up)

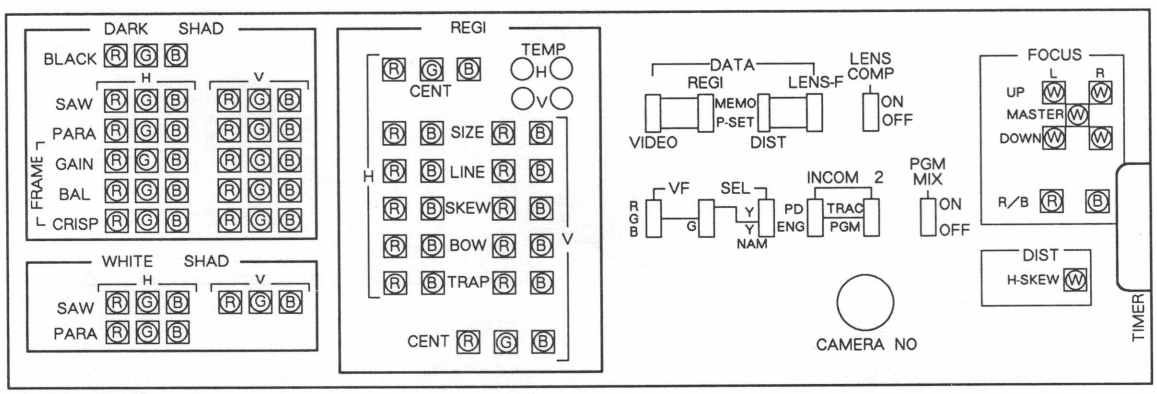
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.5 Vp-p.



SH-34 BOARD (COMPONENT SIDE)

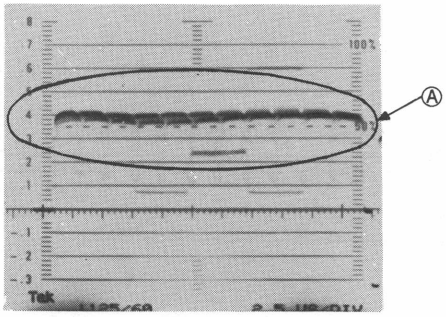


SH-34 COVER

Adjustment procedures

1. Set the switch S2 (DATA DIST)/SH-34 board to MEMO and S3 (DATA VIDEO)/SH-34 board to P-SET.
2. Observing the waveform monitor, adjust the following controls so that the waveform of portion A does not change even when the DISTORTION dial/HDCO operation panel is turned from 100 to − 100 several times.

ch	Adjusting point (SH-34)
G	⊘ RV102 (G D-W)
R	⊘ RV103 (R D-W)
B	⊘ RV101 (B D-W)



3. Set the switch S3 (DATA VIDEO) to MEMO.

Note: After this adjustment is completed, turn off the LENS button on the HDCO operation panel.

6-13. PA OFFSET ADJUSTMENT (HDC)

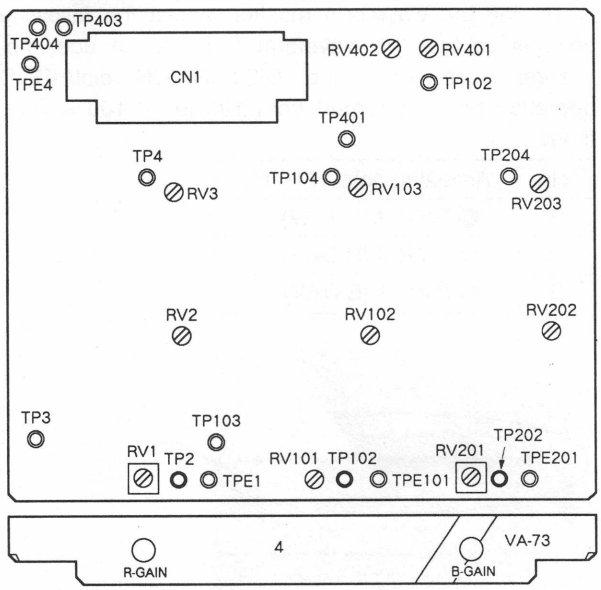
Equipment: Oscilloscope

Preparation

- ND FILTER button/HDCO Operation Panel → 4 (lights up)

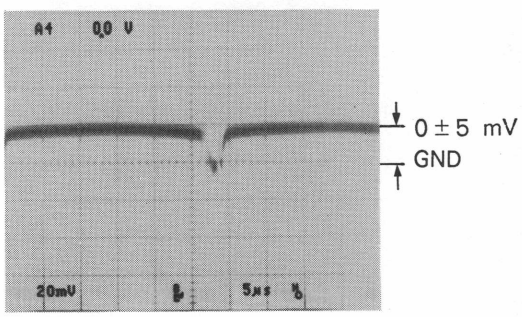
To be extended: VA-73 board

VA-73 BOARD (COMPONENT SIDE)



Adjustment procedures

ch	Test point (VA-73)	Adjusting point (PA-80)	Specification
G	TP102 (GND; E101)	RV4 (DC LEVEL)	0 ± 5 mV for GND
R	TP2 (GND; E1)		
B	TP202 (GND; E201)		



6-14. PA LOW FREQUENCY RESPONSE ADJUSTMENT (HDC) (1/2)

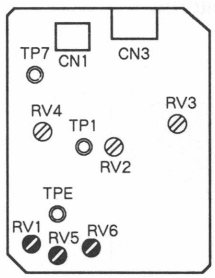
Note: × 10 quantity of lights is used in this adjustment, so take care to prevent the pickup tube from sticking.

Equipment: Waveform monitor, B/W monitor

Preparation

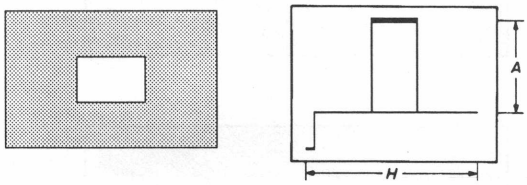
- OPERATE button/HDCO Operation Panel
  → ON (lights up)
- ND FILTER button/HDCO Operation Panel
  → 1 (lights up)
- CC FILTER button/HDCO Operation Panel
  → A (lights up)
- GAMMA FIX button/HDCO Operation Panel
  → ON (lights up)
- KNEE ON button/HDCO Operation Panel
  → OFF (goes off)

Object: White window chart



PA-80 BOARD
(COMPONENT SIDE)

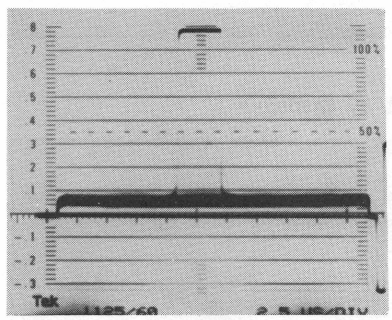
Monitor screen **Waveform monitor**



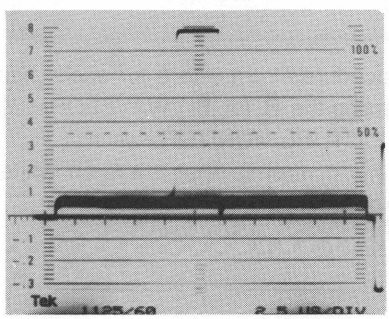
Adjustment procedures

1. Set D IE-1 button/HDCO operation panel to ON and adjust the detail gain dial to 0.
2. Press the G WAVEFORM MONITOR button and G PICTURE MONITOR button/HDCO operation panel.
3. Set to × 2 quantity of lights (200 mV at TP2 on the PA-80 board) with the iris control.
4. Adjust ⊘ RV1 (GAIN)/PA-80 board so that the rising and falling edges at the right and left are equal for G channel.

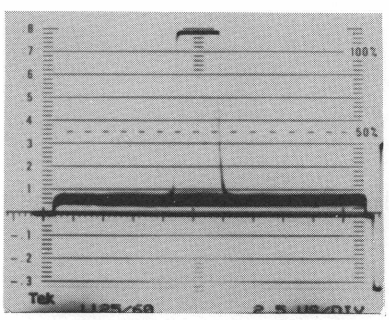
OK



NG

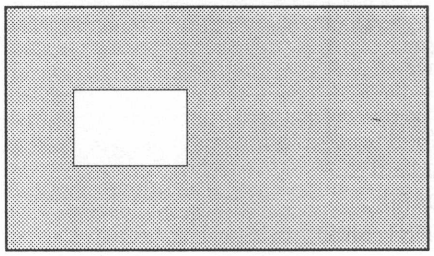


NG

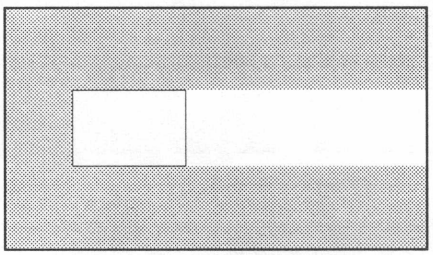


5. Set to × 10 quantity of lights (2V at TP2/PA-80 board) with the iris control.
6. Observing the monitor screen, adjust ⊘ RV5 (L-FREQ-2) and ⊘ RV6 (L-FREQ-3)/PA-80 board so that the following picture can be monitored.

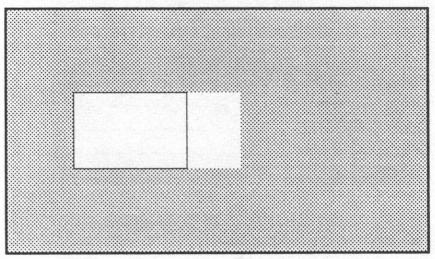
OK



NG
(To be adjust by ⊘RV5)



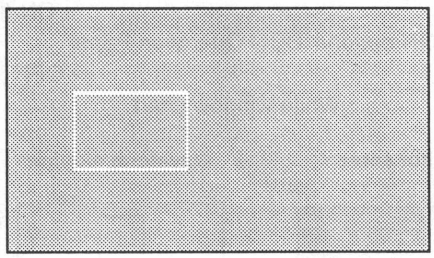
NG
(To be adjust by ⊘RV6)



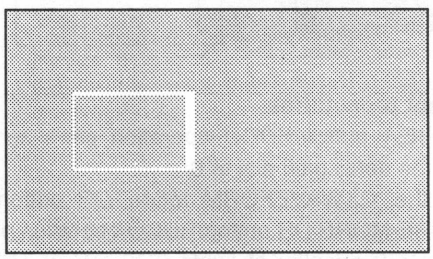
7. Perform procedures from 3 to 6 for each channel of R and B, selecting the [R] (or [B]) WAVEFORM MONITOR switch and PICTURE MONITOR switch.
8. Adjust the iris control so that the G-ch white level at TP2/PA-80 board is 200 mV.
9. Make adjustment so that the following picture is monitored.

PICTURE MONITOR button (HDCO operation panel)	Adjusting point (PA-80)
[R], [–G]	R-ch: ⊘ RV1 (L-FREQ-1)
[B], [–G]	B-ch: ⊘ RV1 (L-FREQ-1)

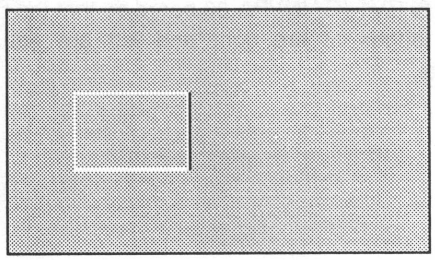
OK



NG



NG



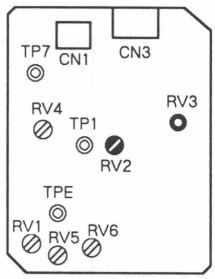
Note: After this adjustment is completed, set the iris control as it was.

6-15. PA HIGH FREQUENCY RESPONSE ADJUSTMENT (HDC) (1/2)

Equipment: Oscilloscope

Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)
- ND FILTER button/HDCO Operation Panel → [1] (lights up)
- CC FILTER button/HDCO Operation Panel → [A] (lights up)
- GAMMA OFF button/HDCO Operation Panel → ON (lights up)
- KNEE ON button/HDCO Operation Panel → OFF (goes off)

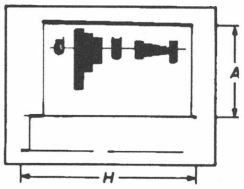


PA-80 BOARD
(COMPONENT SIDE)

Object: Burst chart

Monitor screen

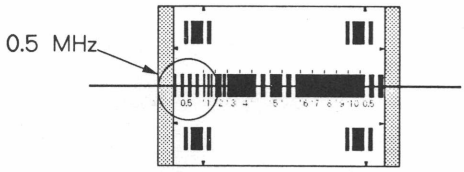
Waveform monitor



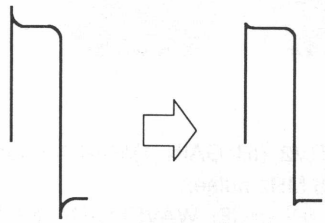
Lens iris: Set the white level to 0.7 Vp-p

Adjustment procedures

1. Set the D-IE1 button/HDCO operation panel to ON and adjust the detail gain dial to 0.
2. Set the best focus.
3. Set the select line of the waveform monitor at the center of chart.

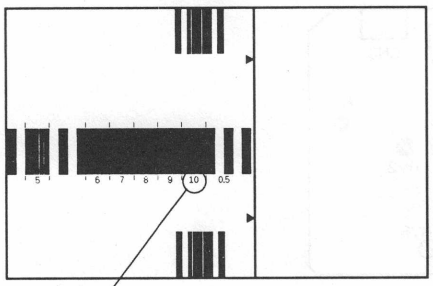


4. Press the [G] WAVEFORM MONITOR button/HDCO operation panel.
5. Turn ⊘ RV3 (fH GAIN 2)/PA-80 board fully counter-clockwise.
6. Observing the waveform monitor, adjust ⊘ RV2 (fH GAIN 1)/PA-80 board so that no spike appears around 0.5 MHz.



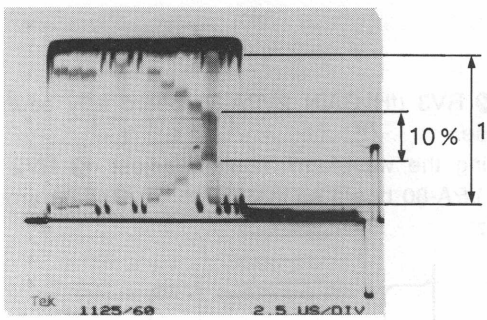
Note: Be sure to set the waveform monitor to X1 mode.

7. Turn off the line selector of the waveform monitor. Center 10 MHz portion of chart on the monitor screen.



Center 10 MHz portion on the monitor screen.

8. Observing the waveform monitor, adjust ◐ RV3 (fH-GAIN 2)/PA-80 board so that the amplitude at 10 MHz is 10% of the 0.5 MHz amplitude.
(As for the units with serial No. 10201 and higher, adjust ◐ RV3 so that the amplitude at 10 MHz is 20 to 30% of the 0.5 MHz amplitude.



9. Adjust ◐ RV2 (fH GAIN 1)/PA-80 board to minimise spike on 0.5 MHz pulse.
10. Select the [R] or [B] WAVEFORM MONITOR button /HDCO operation panel and perform procedures from 5 to 9.
11. Turn off the D-IE1 button/HDCO operation panel and press the [Y] WAVEFORM MONITOR button.

6-16. VF VIDEO GAIN ADJUSTMENT (HDC)

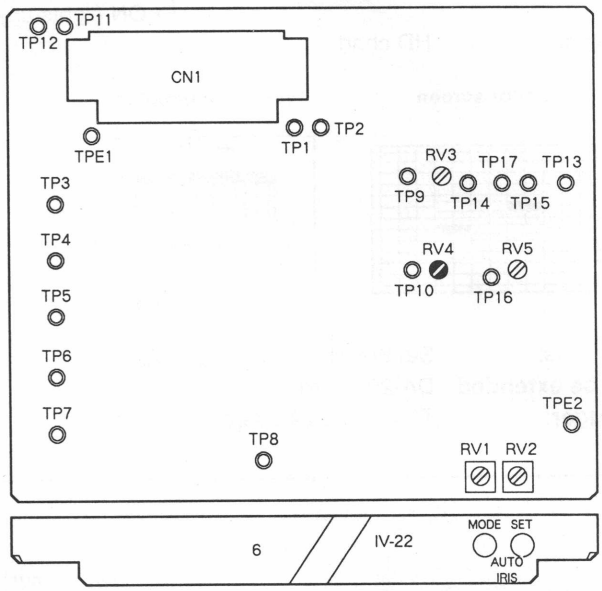
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- GAMMA FIX button/HDCO Operation Panel
  → ON (lights up)

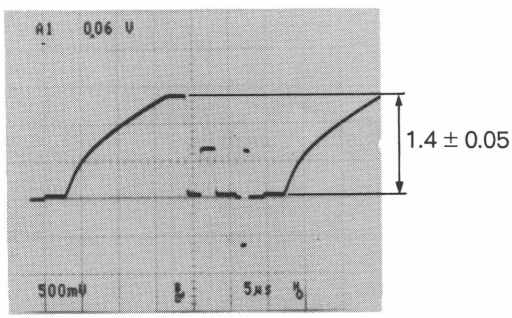
To be extended: IV-22 board

IV-22 BOARD (COMPONENT SIDE)



IV-22 BOARD (PANEL SIDE)

Test point: TP9 (GND; E1)/IV-22 board
Adjusting point: ⊘ RV4 (MONI GAIN)/IV-22 board
Specification: 1.4 ± 0.05 Vp-p



6-17. OVERSHOOT CLIP ADJUSTMENT (HDCS) (1/2)

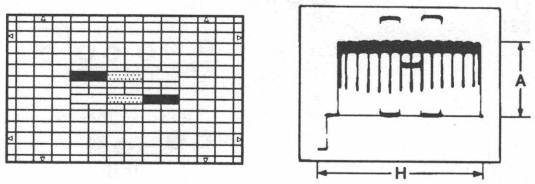
Equipment: Oscilloscope

Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)

Object: HD chart

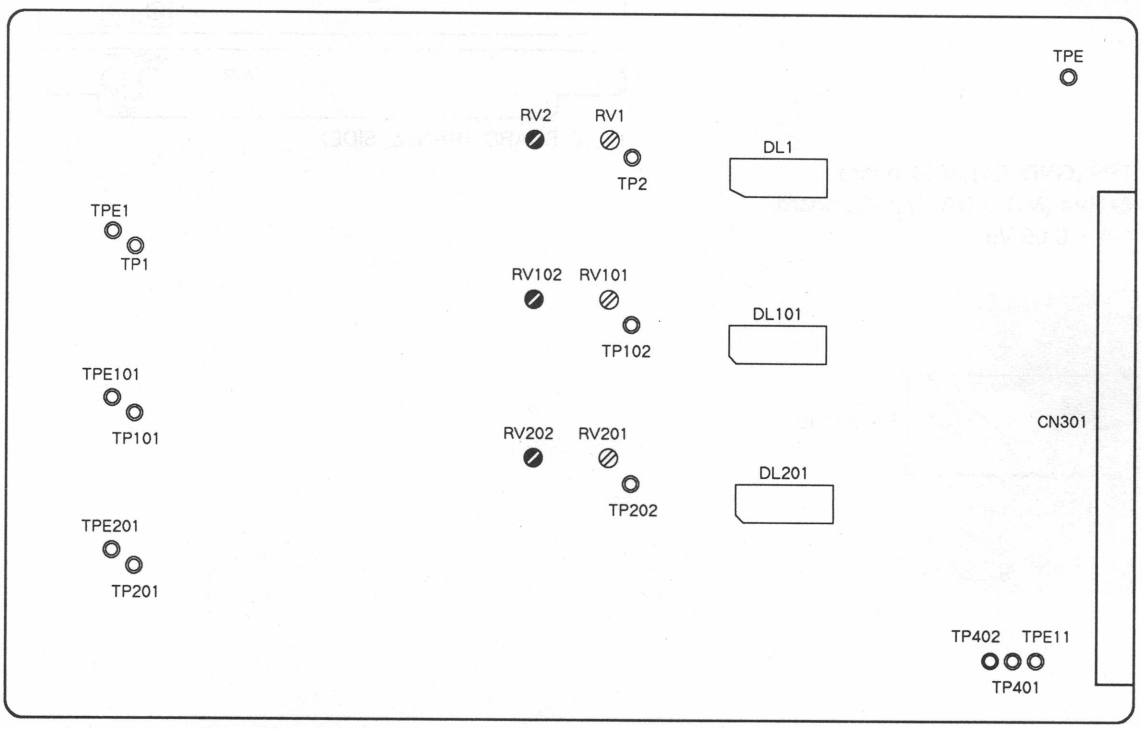
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.7 Vp-p

To be extended: DA-29 board

Trigger: TP402/DA-29 board



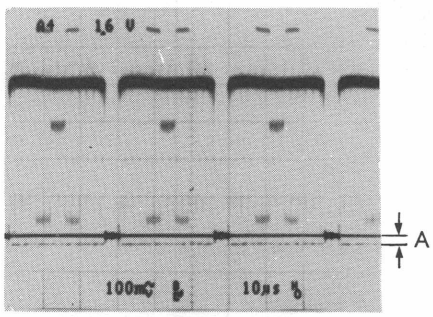
DA-29 BOARD (COMPONENT SIDE)

Adjustment procedures

ch	Test point (DA-29)	Adjusting point (DA-29)	Specification
R	TP1 (GND; E1)	⊘RV50 (R DC SET)	A=15 ± 10 mV
G	TP101 (GND; E101)	⊘RV150 (G DC SET)	
B	TP201 (GND; E201)	⊘RV250 (B DC SET)	

Note: As to the serial No. below 10120, reference numbers of RV are as follows;
⊘RV150 → ⊘RV102
⊘RV50 → ⊘RV2
⊘RV250 → ⊘RV202

1. Set the D IE-1 button/HDCO operation panel to ON and turn the dial 1 to adjust the detail gain to 64.
2. Set the D IE-2 button/HDCO operation panel to ON and turn the dial 3 to adjust the V ratio to 8.
3. Perform adjustments for each channel of G, R and B so that the level A is 15 ± 10 mV.



4. After this adjustment is completed, turn off the D-IE1 and D-IE2 buttons.

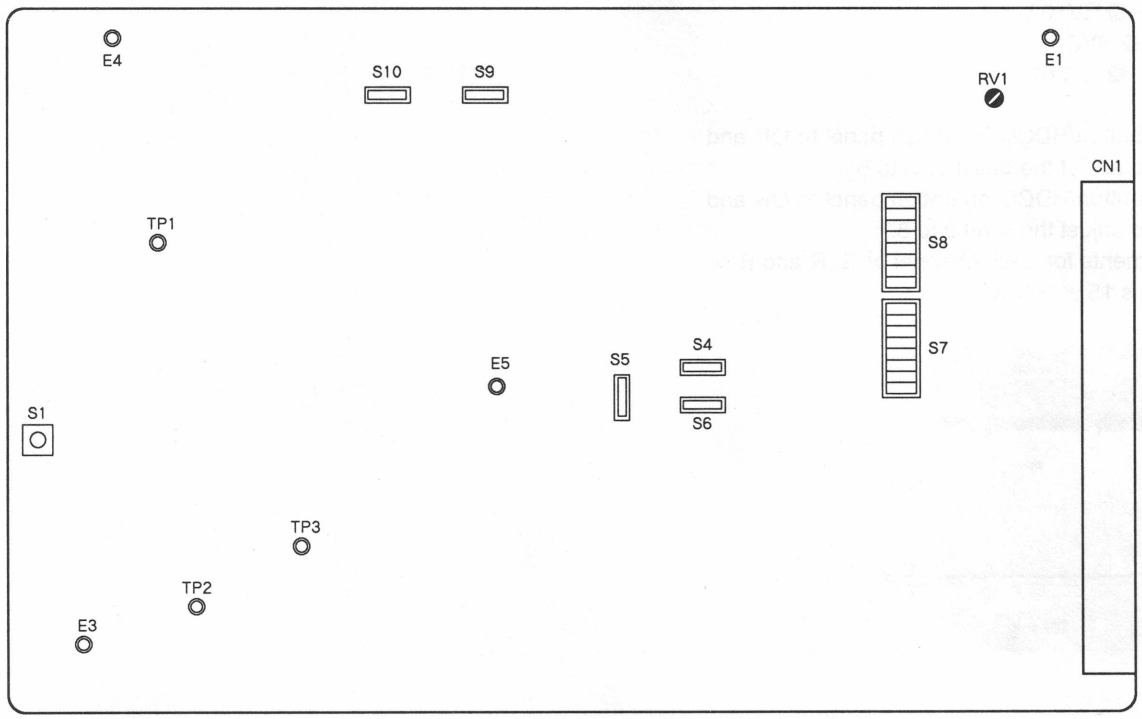
6-18. REFERENCE VOLTAGE ADJUSTMENT (HDCS) (1/2)

Equipment: Digital voltmeter

Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)
- CONTROL DATA (SYSTEM) switch /HDCO Operation Panel → PRESET
- Close the lens iris.

To be extended: IF-212 board



IF-212 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Set the WHT BLK button/HDCO operation panel to ON, turn the B BLK dial to set B BLK level to 0.
2. Adjust ⊘ RV1 (DC CONT ADJ)/IF-212 board so that the level at TP27B (GND; E1) is 0 ± 5 mV.
3. After this adjustment is completed, turn off the WHT BLK button.

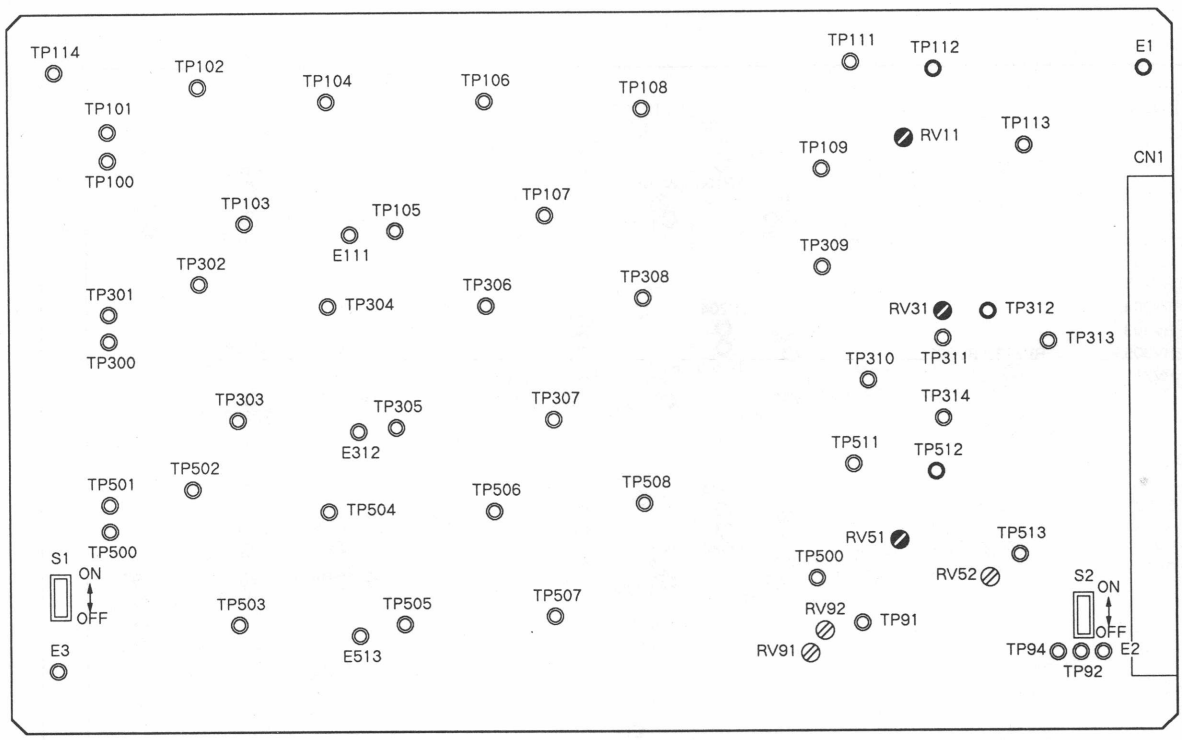
6-19. VIDEO AMPLIFIER GAIN ADJUSTMENT (HDCS)

Equipment: Oscilloscope

Preparation

- TEST (CHU) button/HDCO Operation Panel → ON (lights up)
- TEST (CCU) button/HDCO Operation Panel → OFF (goes off)
- MASTER GAIN button/HDCO Operation Panel → [0] dB (lights up)
- CONTROL DATA (SYSTEM) switch /HDCO Operation Panel → PRESET

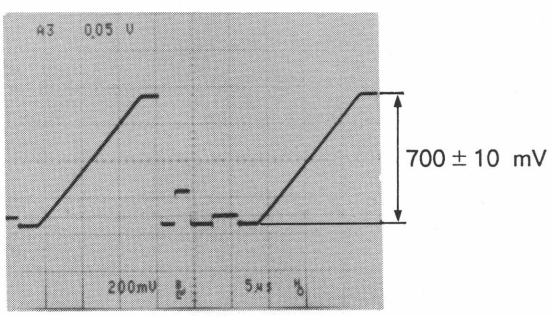
To be extended: IV-18 board



IV-18 BOARD (COMPONENT SIDE)

Adjustment procedures

ch	Test point (IV-18)	Adjusting point (IV-18)	Specification
G	TP312 (GND; E1)	RV31 (G GAIN)	A=700 ± 10 mV
R	TP112 (GND; E1)	RV11 (R GAIN)	
B	TP512 (GND; E1)	RV51 (B GAIN)	



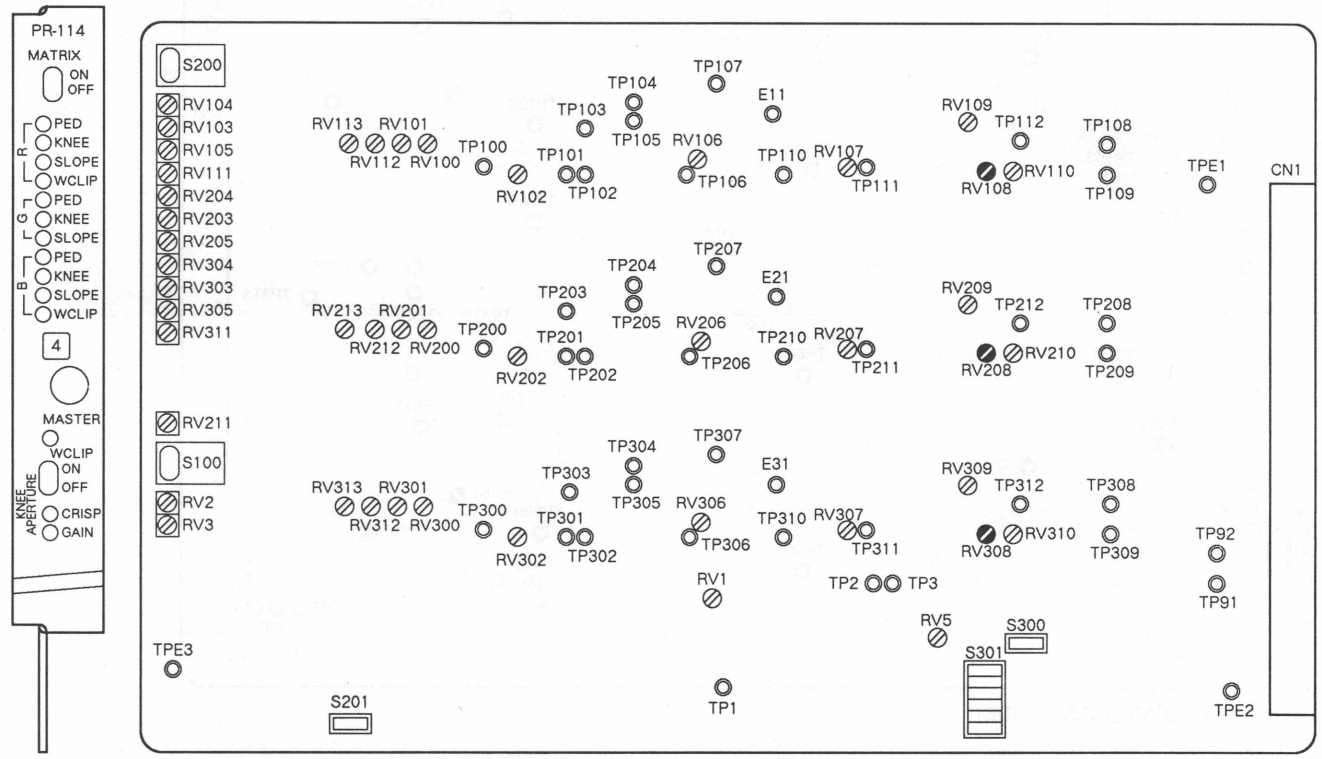
6-20. GAMMA BALANCE ADJUSTMENT (HDCS) (1/2)

Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- CONTROL DATA (SYSTEM) switch
  /HDCO Operation Panel → PRESET
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

To be extended: PR-114 board



(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

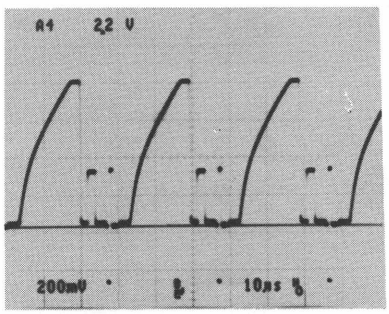
Adjustment procedures

1. Set the switch S100 (APERTURE)/PR-114 board to OFF.

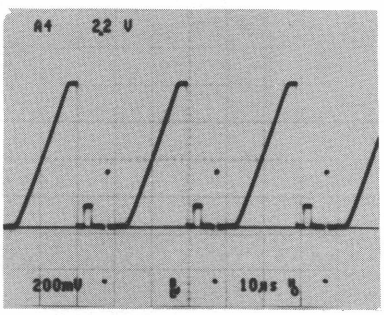
ch	Test point (rear panel)	Adjusting point (PR-114)
R	OUTPUT 1 R/PR (terminated with 75 Ω)	⊘RV108 (R γ-BAL)
G	OUTPUT 1 G/Y (terminated with 75 Ω)	⊘RV208 (G γ-BAL)
B	OUTPUT 1 B/PB (terminated with 75 Ω)	⊘RV308(B γ-BAL)

2. Make adjustment so that the peak level does not change even when selecting GAMMA FIX and GAMMA OFF buttons/HDCO operation panel alternately.

GAMMA FIX



GAMMA OFF



6-21. GAMMA ADJUSTMENT (HDCS) (1/2)

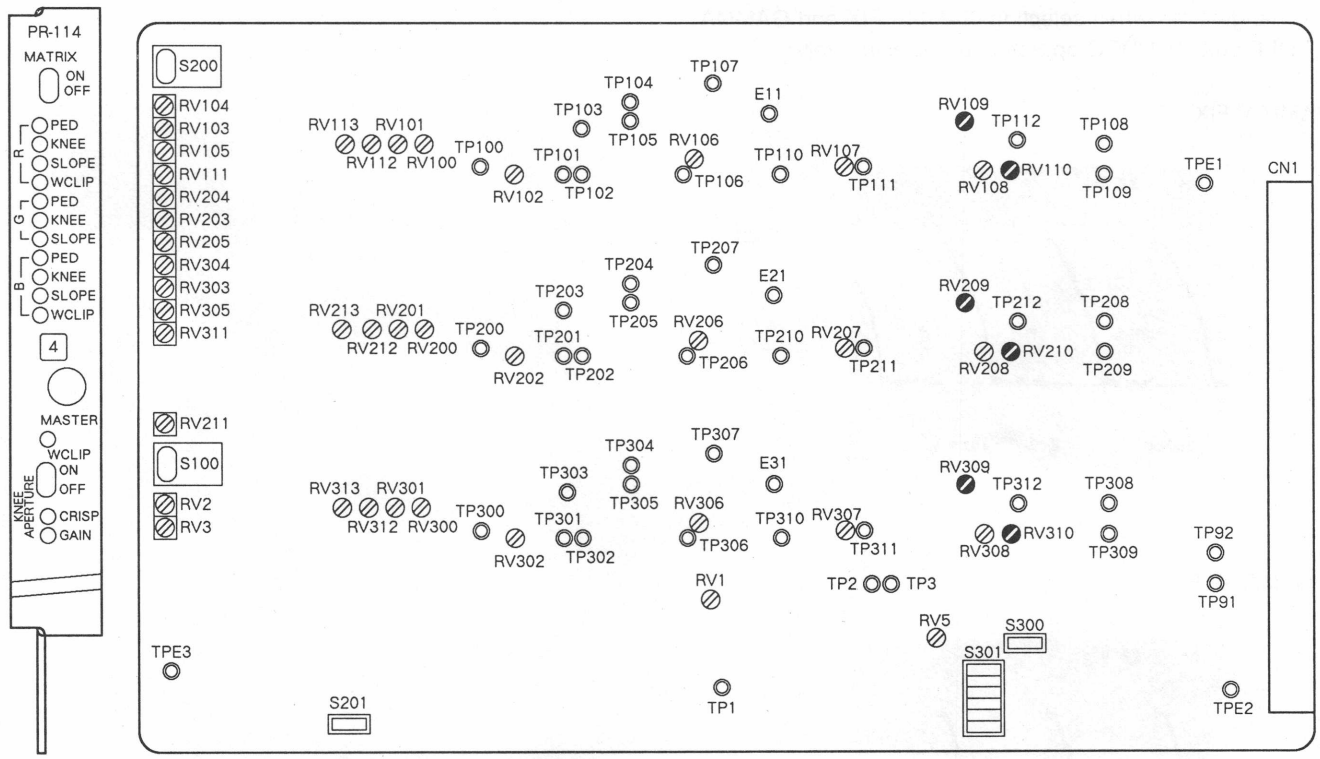
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- GAMMA FIX button/HDCO Operation Panel
  → ON (lights up)
- CONTROL DATA (SYSTEM) switch
  /HDCO Operation Panel → PRESET
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

To be extended: PR-114 board

Trigger: TP92/PR-114 board



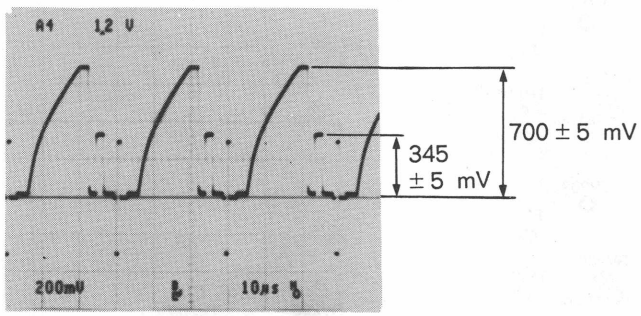
(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

Adjustment procedures

- Perform adjustments for each channel of G, R and B.

ch	Test point (rear panel)	Adjusting point (PR-114)	
G	OUTPUT 1 G/Y (terminated with 75 Ω)	⊘RV210 (G GAIN 4)	⊘RV209 (G- γ)
R	OUTPUT 1 R/PR (terminated with 75 Ω)	⊘RV110 (R GAIN 4)	⊘RV109 (R- γ)
B	OUTPUT 1 B/PB (terminated with 75 Ω)	⊘RV310 (B GAIN 4)	⊘RV309 (B- γ)

1. Adjust ⊘ RV210 (G GAIN 4) so that the peak level is 700 ± 5 mV.
   Adjust ⊘ RV209 (G- γ) so that the pulse level is 345 ± 5 mV.
2. Put the oscilloscope into the dual-trace mode. Make adjustment so that the G-ch waveform is overlapped with R-ch or B-ch waveform.



Note: After adjustment, check "STEP 4-10. PR VIDEO LEVEL/PEDESTAL LEVEL ADJUSTMENT". If the specification is not met, perform STEP 4-10 again.

6-22. KNEE SLOPE ADJUSTMENT (HDCS) (1/2)

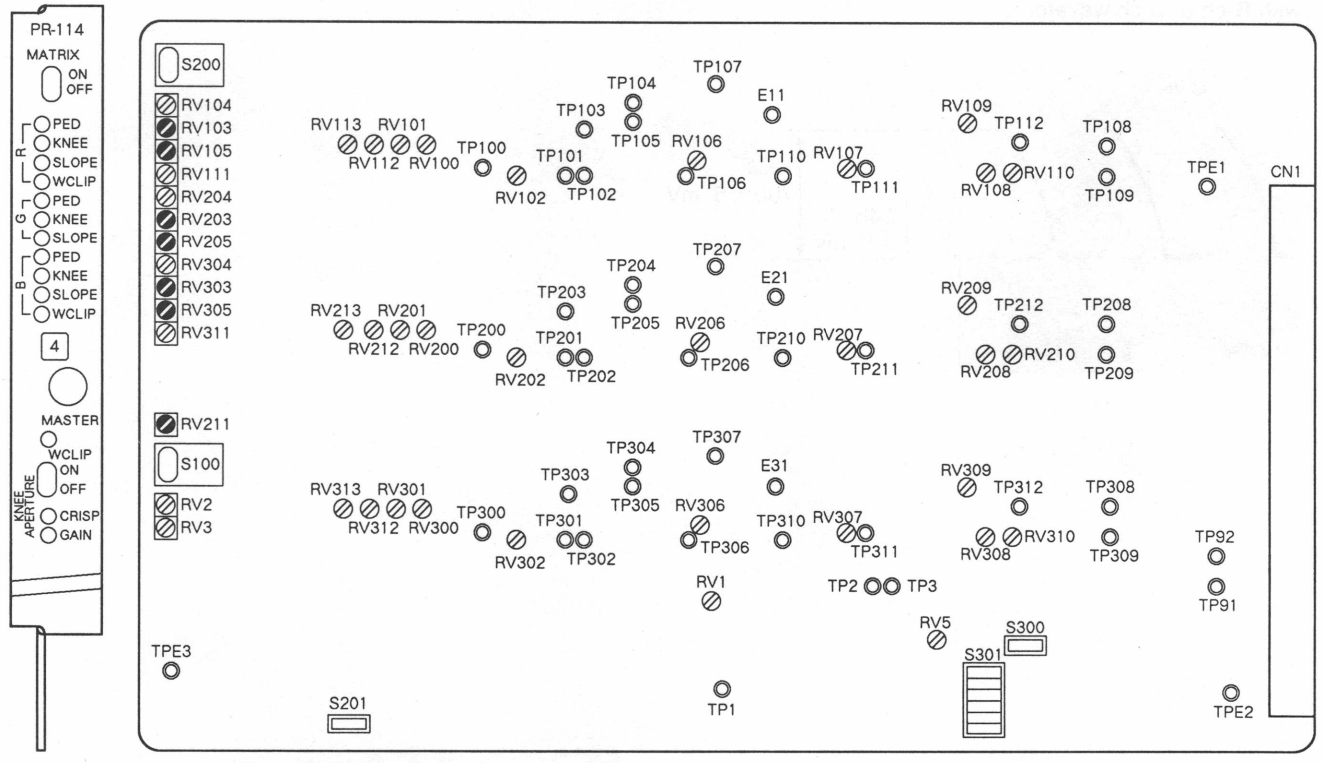
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- GAMMA FIX button/HDCO Operation Panel
  → ON (lights up)
- KNEE ON button/HDCO Operation Panel
  → ON (lights up)
- MASTER GAIN button/HDCO Operation Panel
  → [+6] dB (lights up)
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

To be extended: PR-114 board

Trigger: TP92/PR-114 board

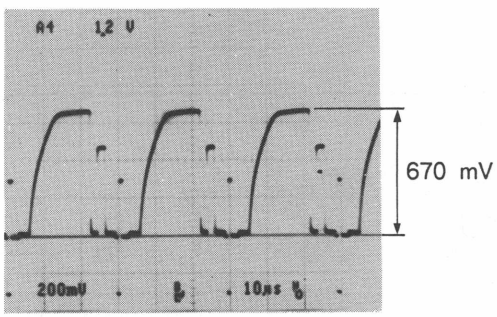


(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

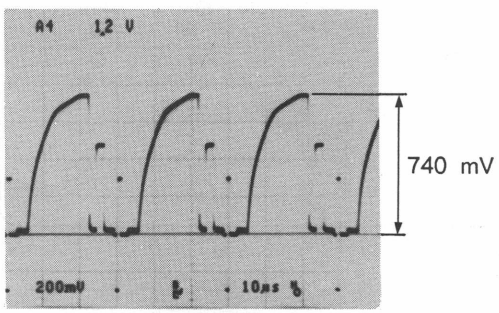
Adjustment procedures

ch	Test point (rear panel)	Adjusting point (PR-114)	
G	OUTPUT 1 G/Y (terminated with 75 Ω)	⊘RV203 (G-KNEE)	⊘RV205 (G-SLOPE)
R	OUTPUT 1 R/PR (terminated with 75 Ω)	⊘RV103 (R-KNEE)	⊘RV105 (R-SLOPE)
B	OUTPUT 1 B/PB (terminated with 75 Ω)	⊘RV303 (B-KNEE)	⊘RV305 (B-SLOPE)

1. Turn ⊘ RV205 (G-SLOPE) fully clockwise (↻) and adjust ⊘ RV203 (G-KNEE) so that the level is 670 mV.



2. Put the oscilloscope into the dual-trace mode. Make adjustment so that the G-ch waveform is overlapped with the R-ch or B-ch waveform.
3. Turn ⊘ RV211 (M-WC)/PR-114 board fully counter-clockwise (↺) and adjust the peak level for 740 mV with ⊘ RV205 (G-SLOPE).



4. Put the oscilloscope into the dual-trace mode. Make adjustment so that the G-ch waveform is overlapped with the R-ch or B-ch waveform.

Note: After this adjustment is completed, set the following buttons as follows;

- GAMMA OFF button → ON (lights up)
- KNEE ON button → OFF (goes off)
- MASTER GAIN button → [0] dB (lights up)

6-23. WHITE CLIP ADJUSTMENT (HDCS) (1/2)

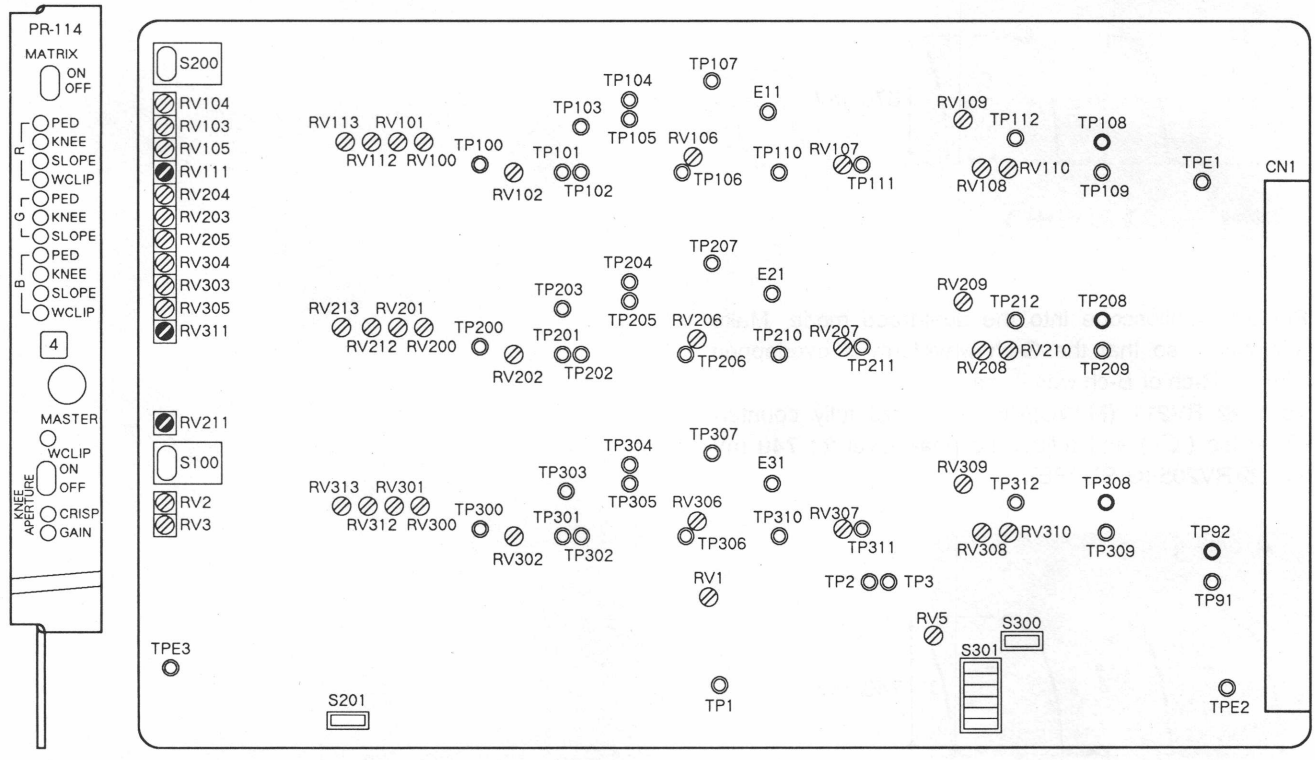
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- KNEE ON button/HDCO Operation Panel
  → OFF (goes off)
- GAMMA OFF button/HDCO Operation Panel
  → ON (lights up)
- MASTER GAIN button/HDCO Operation Panel
  → [+6] dB (lights up)
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

To be extended: PR-114 board

Trigger: TP92/PR-114 board

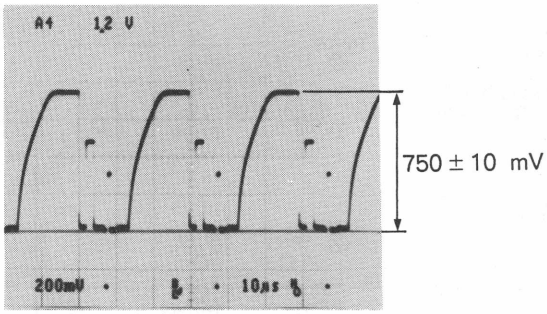


(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

Adjustment procedures

	G-ch	R-ch	B-ch
Test point (PR-114)	TP208	TP108	TP308
Adjusting point (PR114)	⊘ RV211 (G-WHT CLIP)	⊘ RV111 (R-WHT CLIP)	⊘ RV311 (B-WHT CLIP)

1. Adjust ⊘ RV211 (G-WHT CLIP) so that the peak level at TP208 is 750 ± 10 mV.
2. Put the oscilloscope into the dual trace mode. Adjust ⊘ RV111 for R-ch (⊘ RV311 for B-ch) so that the R-ch (or B-ch) waveform is overlapped with the G-ch waveform.



Note: After this adjustment is completed, press the [0] dB MASTER GAIN button/HDCO operation panel.

6-24. APERTURE ADJUSTMENT (HDCS) (1/2)

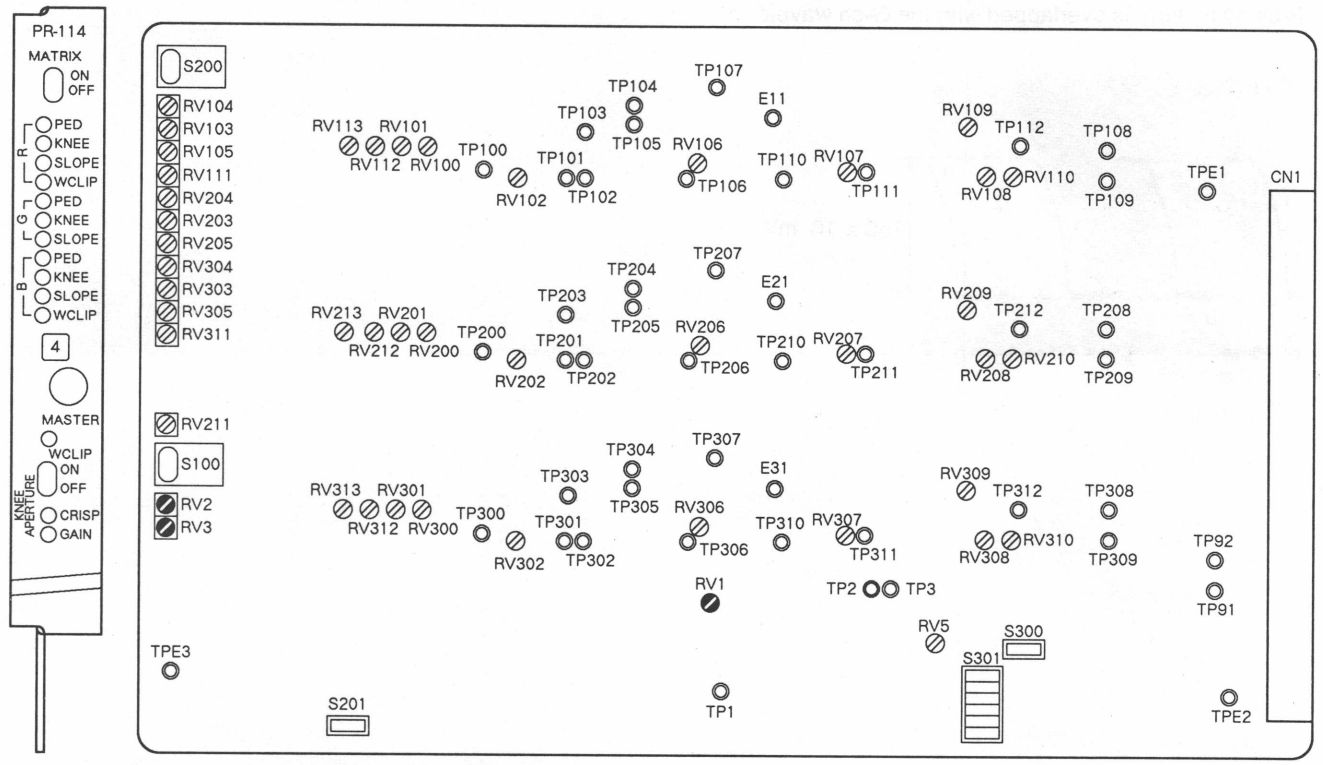
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

To be extended: PR-114 board

Trigger: TP92/PR-114 board

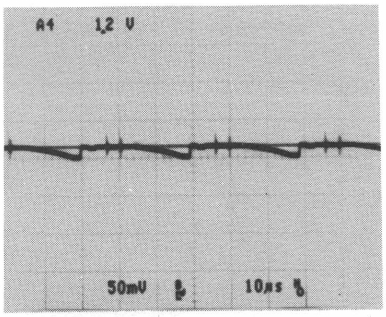


(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

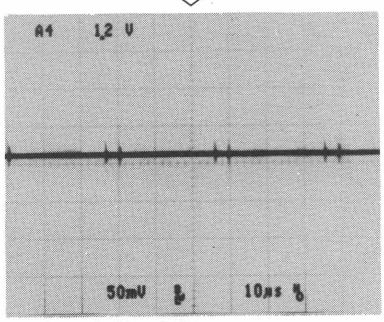
Adjustment procedures

1. Set the switch S100 (APERTURE)/PR-114 board to ON.
2. Adjust ⊘ RV1 (DTL BAL)/PR-114 board so that the waveform at TP2 is flat.

NG



OK



3. Adjust the gain and crispening to proper levels with ⊘ RV2 (CRISP LEVEL) and ⊘ RV3 (KNEE APERTURE GAIN)/PR-114 board.
4. Set the switch S100 (APERTURE)/PR-114 board to OFF.

6-25. AUTO KNEE PEAK ADJUSTMENT (HDCS) (1/2)

Note: This adjustment is applicable to the units with serial No. 10201 and higher.
After the adjustment, return the switch S2 (ANALOG THROUGH)/SG-140 board to NG position.
Digital IE does not work unless it is returned.

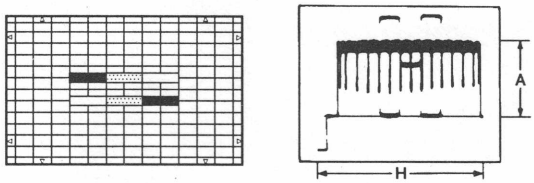
Equipment: Oscilloscope

Preparation

- OPERATE button/HDCO Operation Panel → ON (lights up)
- CONTROL DATA (SYSTEM) switch → MEMORY
- CONTROL DATA (CCU) switch → MEMORY
- S2 (ANALOG THROUGH)/SG-140 board:
  Serial No. 10001 to 10009 → AS
  Serial No. 10101 and higher → ON

Object: HD chart

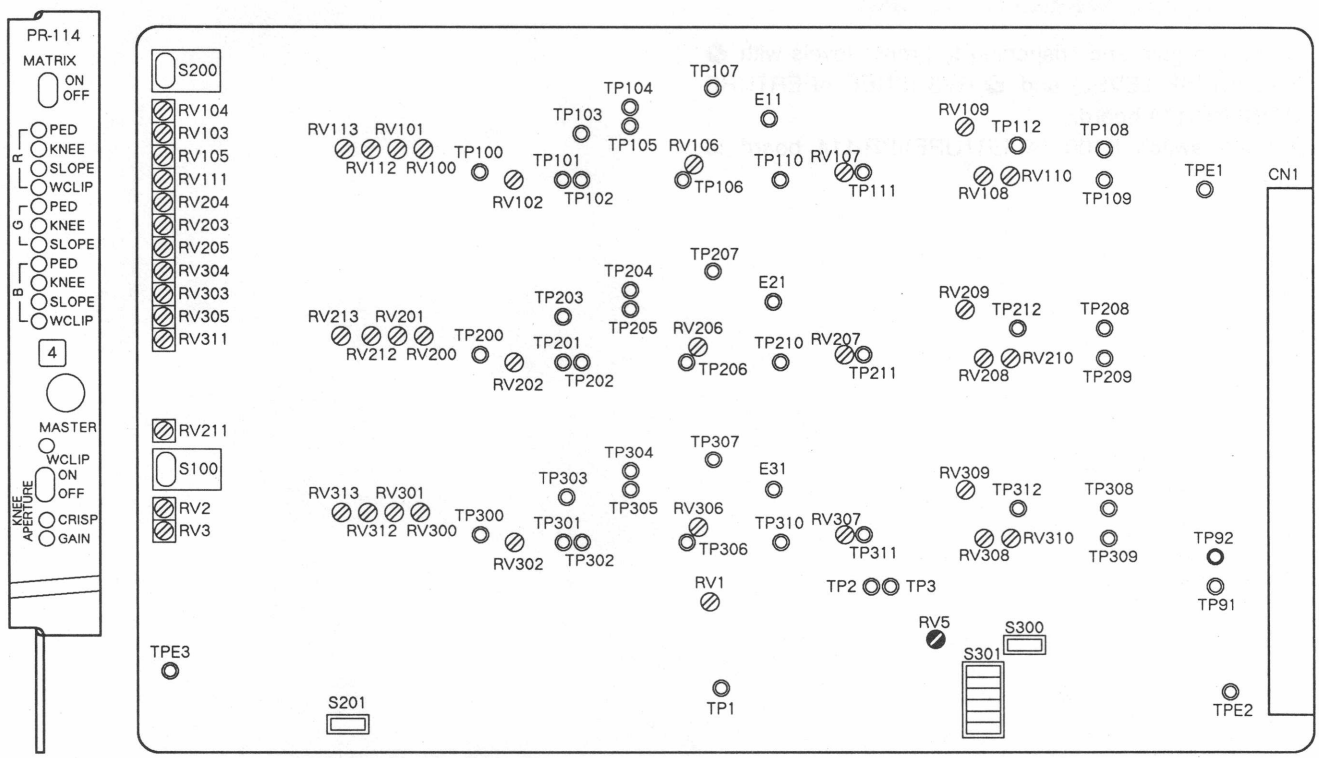
Monitor screen **Waveform monitor**



Lens iris: Set the white level to 0.7 Vp-p.

To be extended: PR-114 board

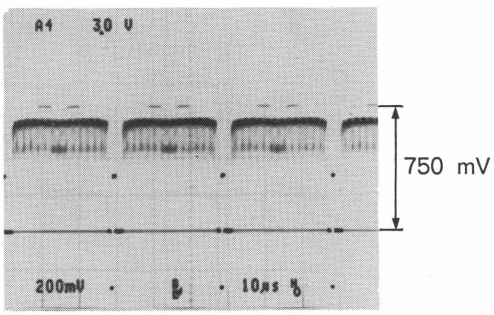
Trigger: TP92/PR-114 board



(PANEL SIDE) PR-114 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Set the WHT BLK button/HDCO operation panel to ON and adjust the R/B BLK and R/B WHT dials so that their readings are 0.
2. Set the CONTRAST button/HDCO operation panel to ON and adjust the SLOPE dial so that the reading is 0.
3. Set the KNEE AUTO button/HDCO operation panel to ON and open the lens iris by one stop. Adjust ◐ RV5 (LEVEL ADJ)/PR-114 board so that the white peak level is 750 mV.



4. After this adjustment is completed, turn off the WHT BLK, CONTRAST and KNEE AUTO buttons.

6-26. A/D CONVERTOR REFERENCE VOLTAGE ADJUSTMENT (HDCS)

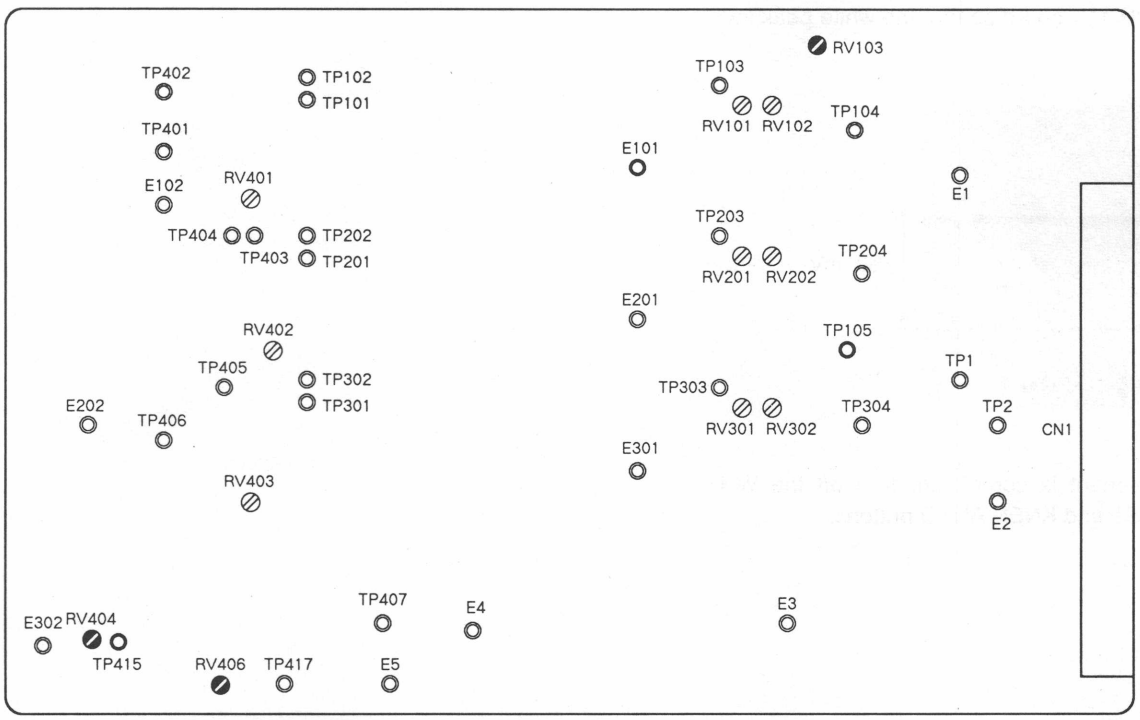
Note: Confirm that the setting position of S2/SG-140 board is NG (for serial No. 10001 to 10009) or OFF (serial No. 10101 and higher).

Equipment: Digital voltmeter

Preparation

- Close the lens iris.

To be extended: AD-39 board



AD-39 BOARD (COMPONENT SIDE)

Adjustment procedures

Test point (AD-39)	Adjusting point (AD-39)	Specification
TP105 (GND; E101)	RV103 (V REF)	–2V ± 0.005V
TP415 (GND; E101)	RV404 (V REF)	+3.81 ± 0.005V
TP407 (GND; E101)	RV406 (V REF)	+1.23 ± 0.005V

6-27. A/D CONVERTOR BLACK ADJUSTMENT (HDCS) (1/2)

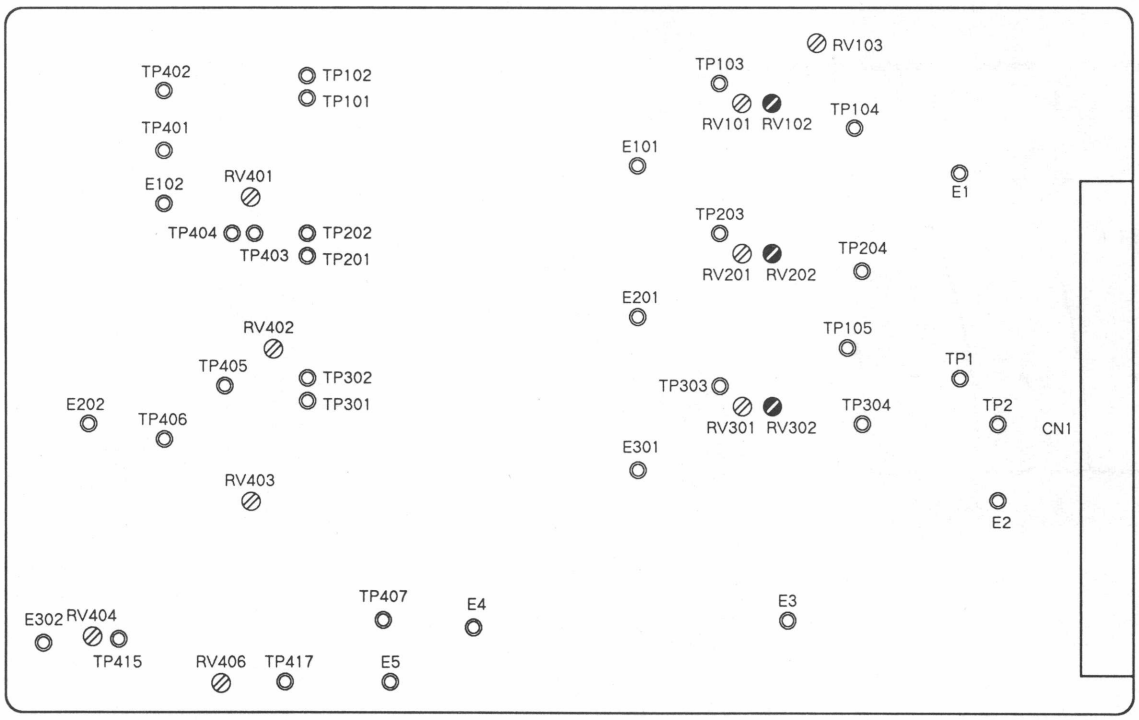
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel → ON (lights up)
- MASTER GAIN button/HDCO Operation Panel → MEMORY
- CONTROL DATA (SYSTEM) switch /HDCO Operation Panel → MEMORY
- CONTROL DATA (CCU) switch/HDCO Operation Panel → MEMORY
- MASTER BLACK control/HDCO Operation Panel → ◯ fully counterclockwise

To be extended: AD-39 board

Trigger: TB40B/extension board

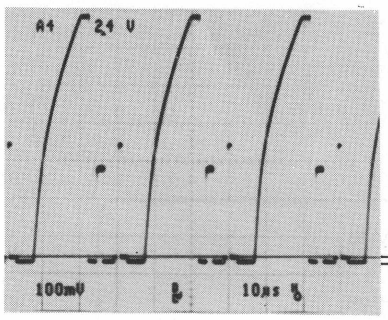


AD-39 BOARD (COMPONENT SIDE)

Adjustment procedures

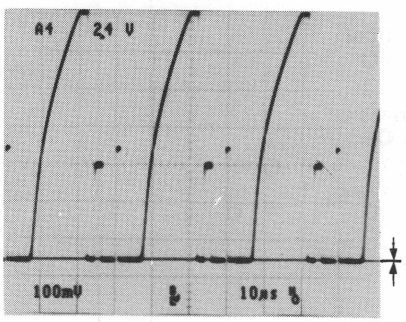
ch	Test point (rear panel)	Adjusting point (AD-39)
R	OUTPUT 1 R/PR (terminated with 75 Ω)	⊘RV102 (R PED)
G	OUTPUT 1 G/Y (terminated with 75 Ω)	⊘RV202 (G PED)
B	OUTPUT 1 B/PB (terminated with 75 Ω)	⊘RV302 (B PED)

NG



0 ± 2 mV

OK



Note: After this adjustment is completed, set the MASTER BLACK control to mechanical center.

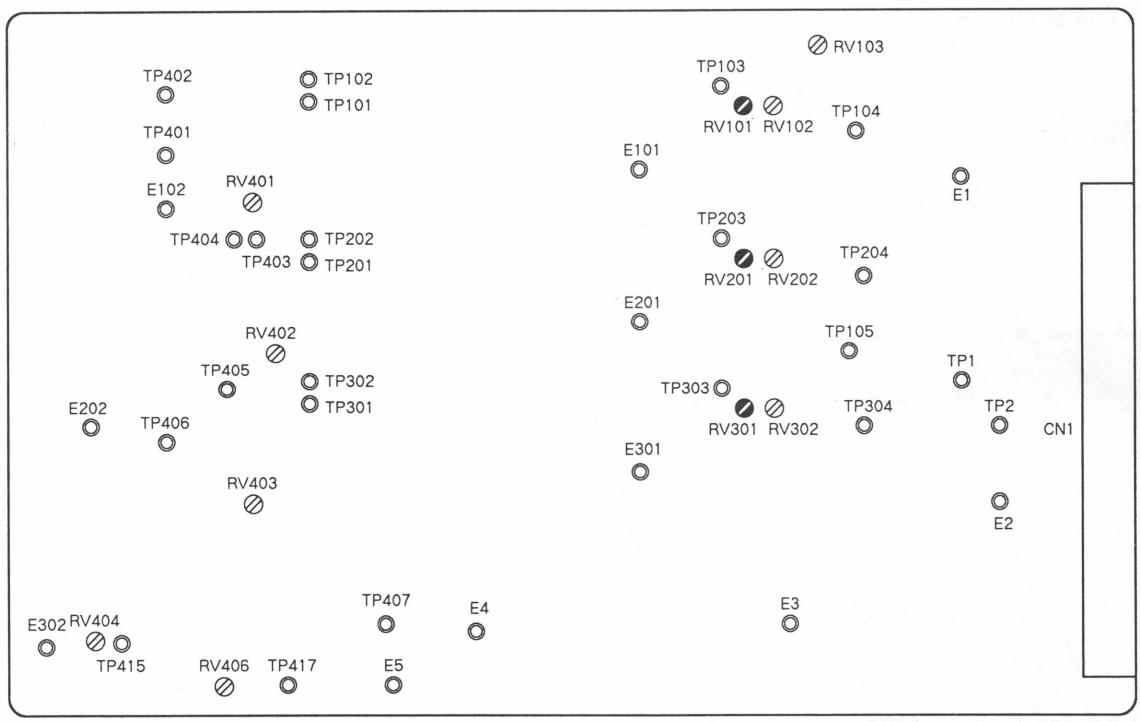
6-28. A/D CONVERTOR WHITE ADJUSTMENT (HDCS) (1/2)

Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)
- CONTROL DATA (SYSTEM) switch
  /HDCO Operation Panel → PRESET
- S8 (TEST MODE)/DT-19 board → upper side

To be extended: AD-39 board



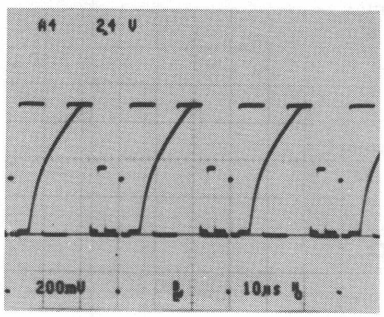
AD-39 BOARD (COMPONENT SIDE)

Adjustment procedures

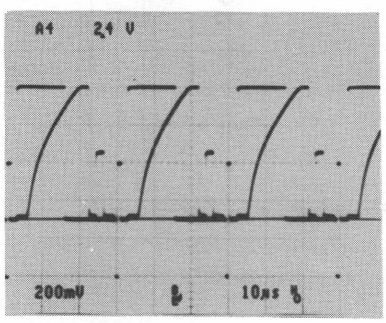
ch	Test point (rear panel)	Adjusting point (AD-39)
R	OUTPUT 1 R/PR (terminated with 75 Ω)	◐ RV101 (R GAIN ADJ)
G	OUTPUT 1 G/Y (terminated with 75 Ω)	◐ RV201 (G GAIN ADJ)
B	OUTPUT 1 B/PB (terminated with 75 Ω)	◐ RV301 (B GAIN ADJ)

• Match the color bar peak and the TEST SAW peak.

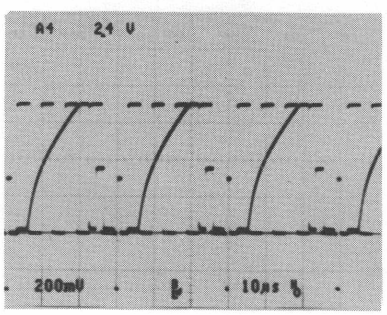
[R]



[G]



[B]



Note: After adjustment, set S8 (TEST MODE)/DT-19 board to the center position.

7-1. AUTO SYSTEM G GAIN AND R-G/B-G BALANCE ADJUSTMENT (HDCS)

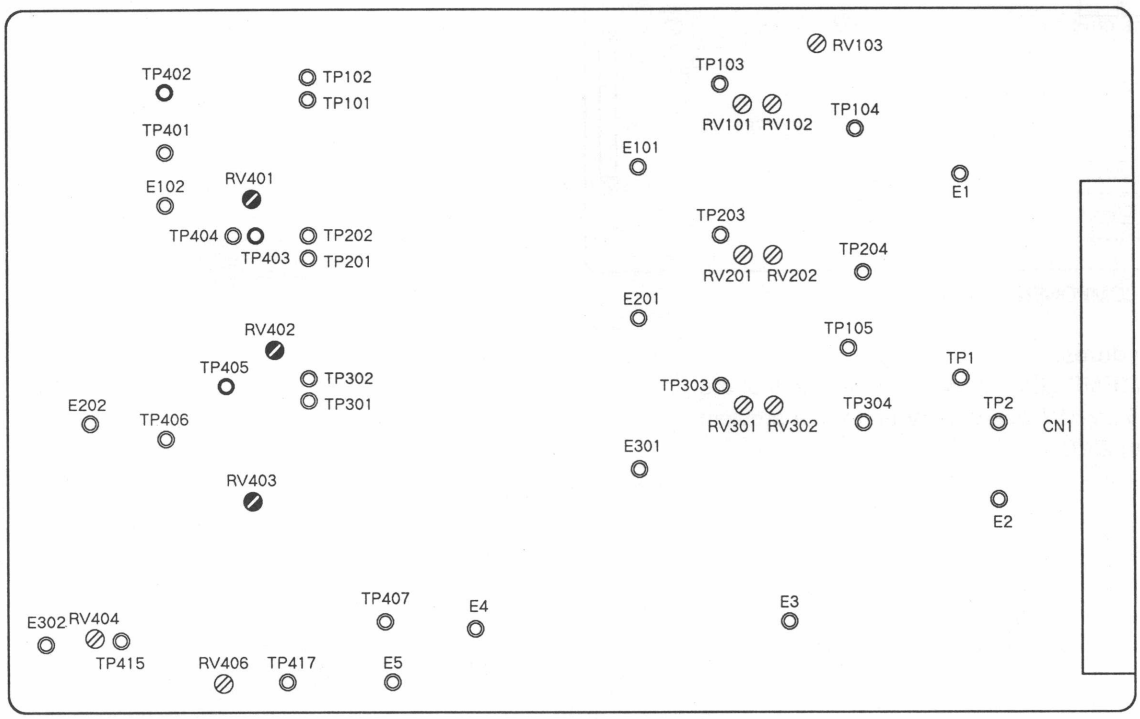
Equipment: Oscilloscope

Preparation

- TEST (CCU) button/HDCO Operation Panel
  → OFF (goes off)
- TEST (CHU) button/HDCO Operation Panel
  → ON (lights up)

To be extended: AD-39 board

Trigger: TP40B/extension board

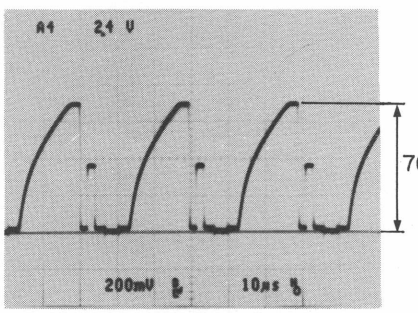


AD-39 BOARD (COMPONENT SIDE)

Adjustment procedures

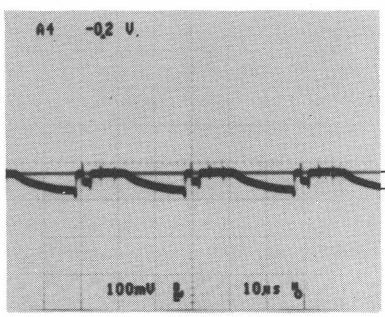
WFM button setting /operation panel	Test point (AD-39)	Adjusting point (AD-39)
G	TP403 (GND; E201)	RV402 (G GAIN)
R, -G	TP402 (GND; E101)	RV401 (R–G GAIN)
B, -G	TP405 (GND; E301)	RV403 (B–G GAIN)

[G-ch]

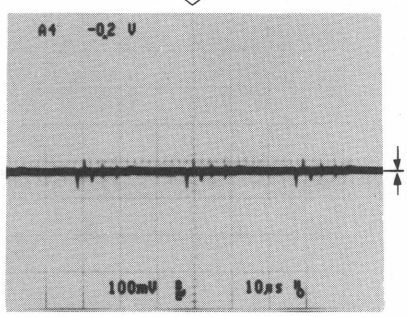


[R-G, B-G]

NG



OK

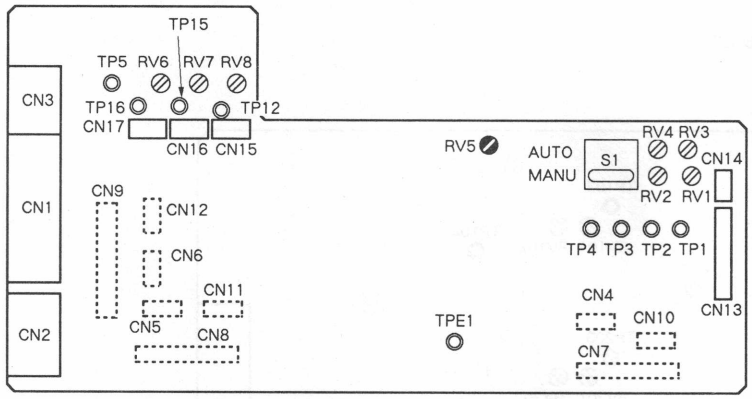


7-2. TEMPERATURE SENSOR ADJUSTMENT (HDC)

Equipment: Digital voltmeter

Preparation

- Close the lens iris.



SV-107 BOARD (COMPONENT SIDE)

Adjustment procedures

- Adjust ⊘ RV5 (TEMP LEVEL)/SV-107 board so that the DC level at TP5/SV-107 board is 0V under the ambient temperature with 25 ℃.

Note: Do not turn ⊘ RV101, ⊘ RV102 and ⊘ RV103/IF-213 board.

7-3. AUTO IRIS ADJUSTMENT (HDC)

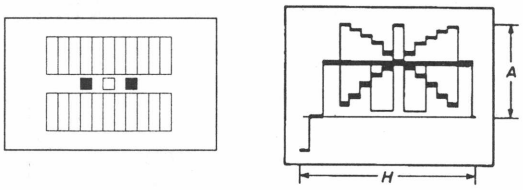
Equipment: Waveform monitor

Preparation

- OPERATE button/HDCO Operation Panel
  → ON (lights up)
- IRIS AUTO button/HDCO Operation Panel
  → ON (lights up)

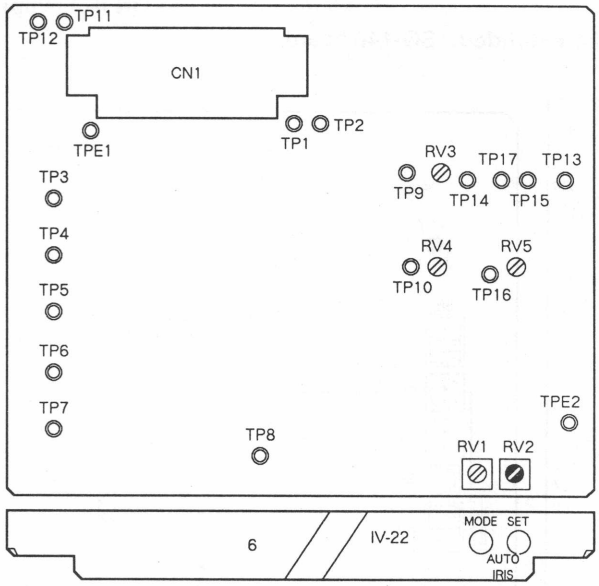
Object: Gray scale chart

Monitor screen **Waveform monitor**



To be extended: IV-22 board

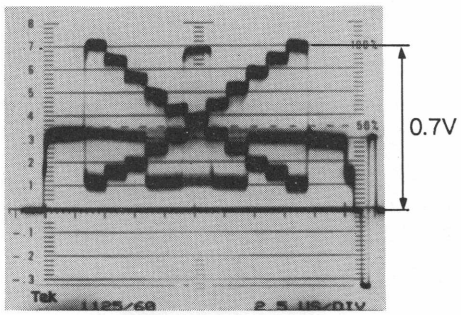
IV-22 BOARD (COMPONENT SIDE)



(PANEL SIDE)

Adjustment procedures

1. Adjust ⊘ RV2 (AUTO IRIS LEVEL)/IV-22 board so that the white level is 0.7 Vp-p.



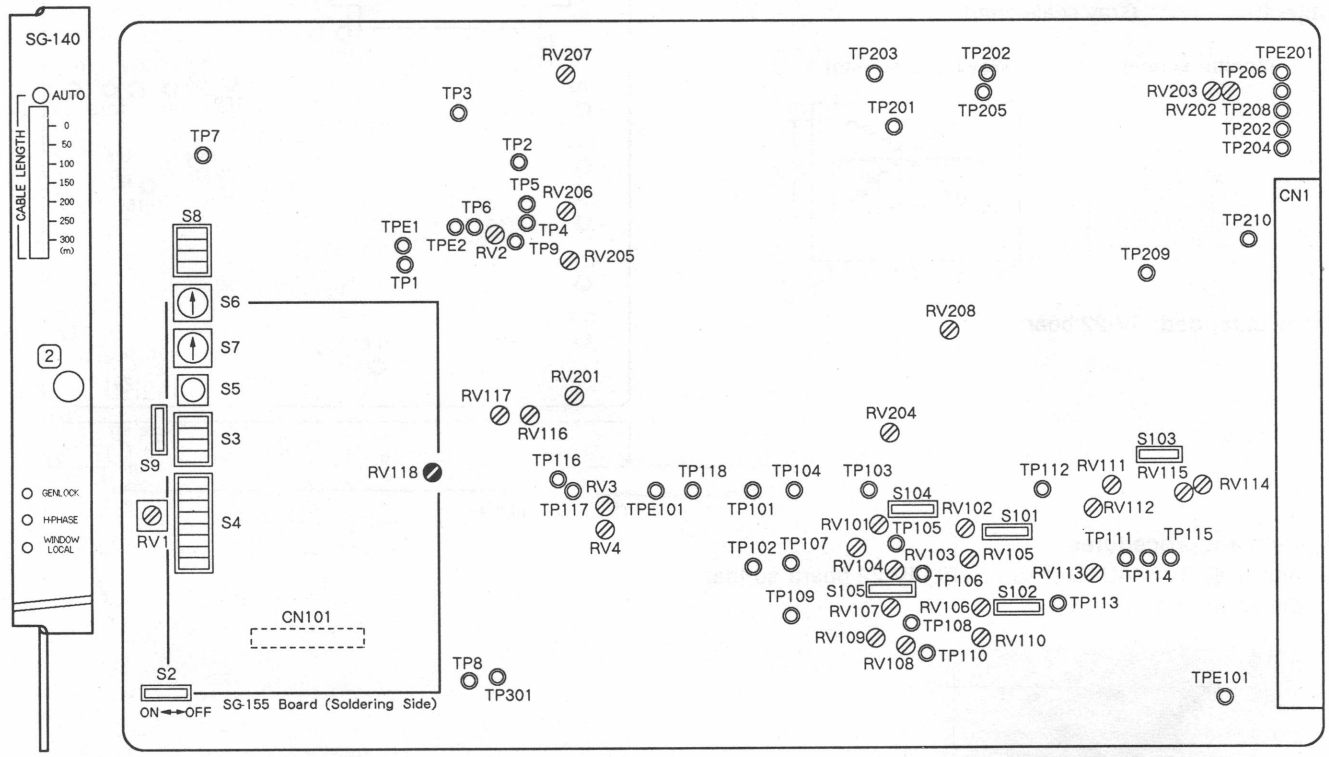
8-1. INCOM SAMPLE PULSE PHASE ADJUSTMENT (HDCS)

Equipment: Oscilloscope

Preparations

- TEST (CCU) button/HDCO operation panel
  → ON (lights up)

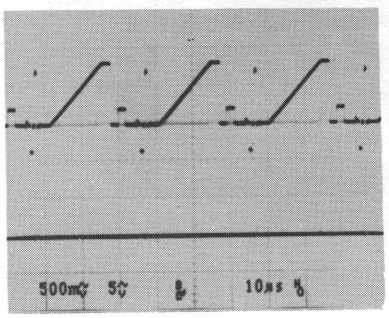
To be extended: SG-140 board



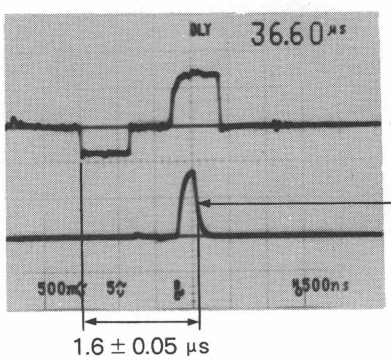
(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

Adjustment procedures

1. Remove the SG-155 board and insert it into the connector on the SG-140 board vertically.
2. Put the oscilloscope into the dual-trace mode and connect probes as follows.
   - Connect CH-1 of oscilloscope to TP311/IV-18 board using a lead wire.
   - Connect CH-2 of oscilloscope to TP38B/extension board by extending the SG-140 board.
3. Adjust ⊘ RV118 (PHASE ADJ)/SG-140 board so that the following waveforms are output.



MAGNIFY



8-2. INCOM ADJUSTMENT (1/8)

Equipment: Oscilloscope, Audio frequency oscillator

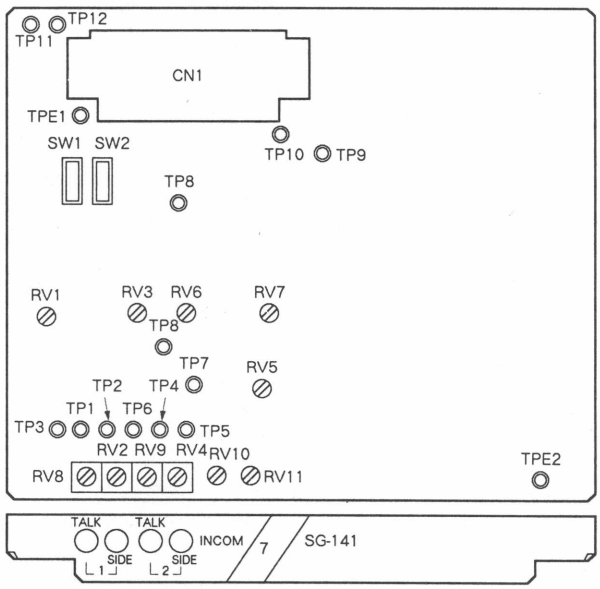
Preparations

- Close the lens iris.
- Prepare the headset.

Adjustment procedures

1. Extend the SG-141 board (HDC).

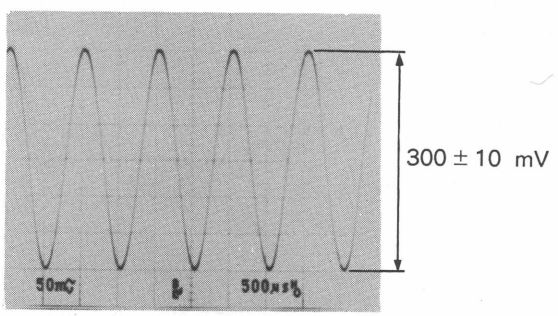
SG-141 BOARD (COMPONENT SIDE)



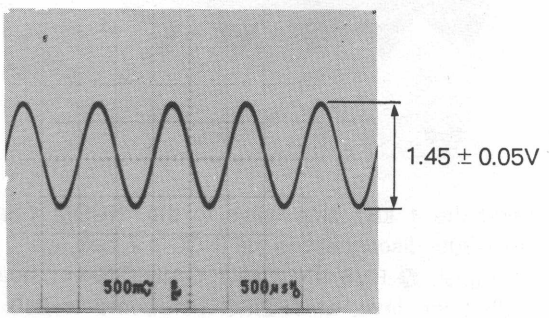
(PANEL SIDE)

- Feed the 1 kHz (300 ± 10 mVp-p) sine wave to the INCOM 1 jack of HDC-300.
  Turn on the MIC switch of HDC-300.
- Set the switches S1 (MIC SELECT 1) and S2 (MIC SELECT 2)/ SG-141 board to CARBON position.
- Set the switch S7 (PD/ENG)/SH-34 board (HDC) to PD position.

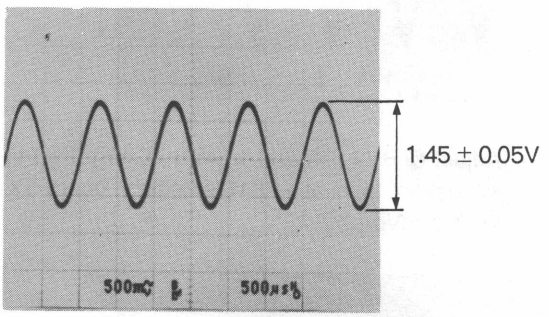
2. Confirm that the following waveform is output at TPA13/extension board EX-188.



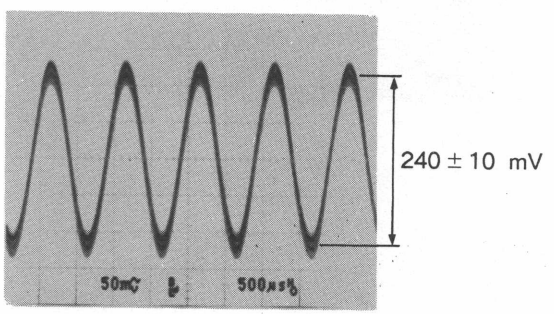
3. Adjust RV1 (INCOM 1 AGC ADJ)/SG-141 board so that the level at TP1/SG-141 board is 1.45 ± 0.05V.



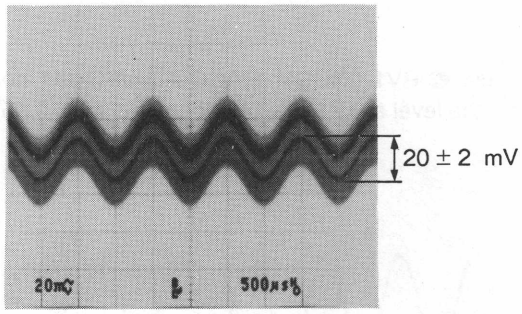
4. Feed the 1 kHz (300 ± 10 mVp-p) sine wave to the INCOM 2 jack of HDC-300, disconnecting the INCOM 1 jack.
   - Adjust RV3 (INCOM 2 AGC ADJ)/SG-141 board so that the level at TP4/SG-141 board is 1.45 ± 0.05V.



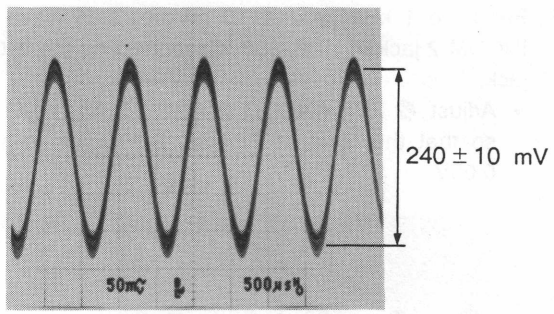
   - Adjust RV9 (INCOM 2 GAIN)/SG-141 board so that the level at TP5/SG-141 board is 240 ± 10 mVp-p.



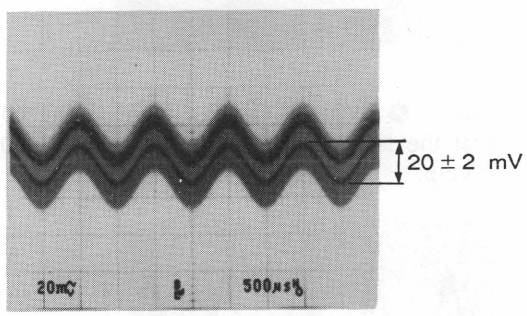
- Adjust ⊘ RV4 (INCOM 2 SIDE TONE)/SG-141 board so that the level at TPB17/extension board EX-188 is 20 ± 2 mVp-p.



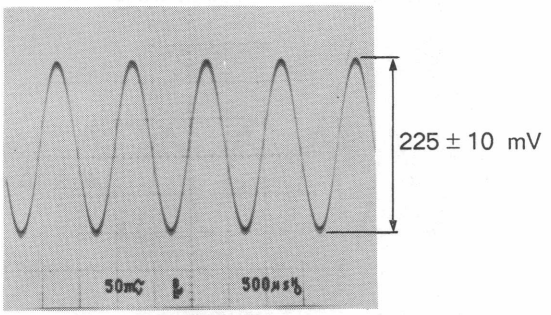
5. Feed the 1 kHz sine wave to the INCOM 1 jack of HDC-300, disconnecting the INCOM 2 jack.
   - Adjust ⊘ RV8 (INCOM 1 GAIN)/SG-141 board so that the level at TP2/SG-141 board is 240 ± 10 mVp-p.



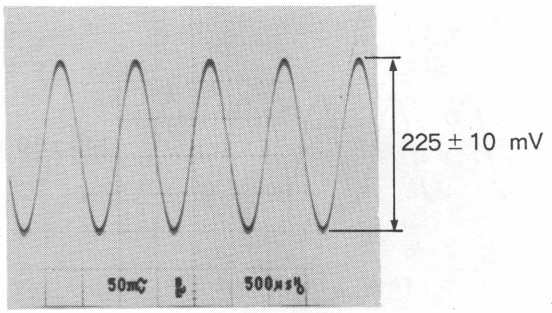
   - Adjust ⊘ RV2 (INCOM 1 SIDE TONE)/SG-141 board so that the level at TPB16/extension board EX-188 is 20 ± 2 mVp-p.

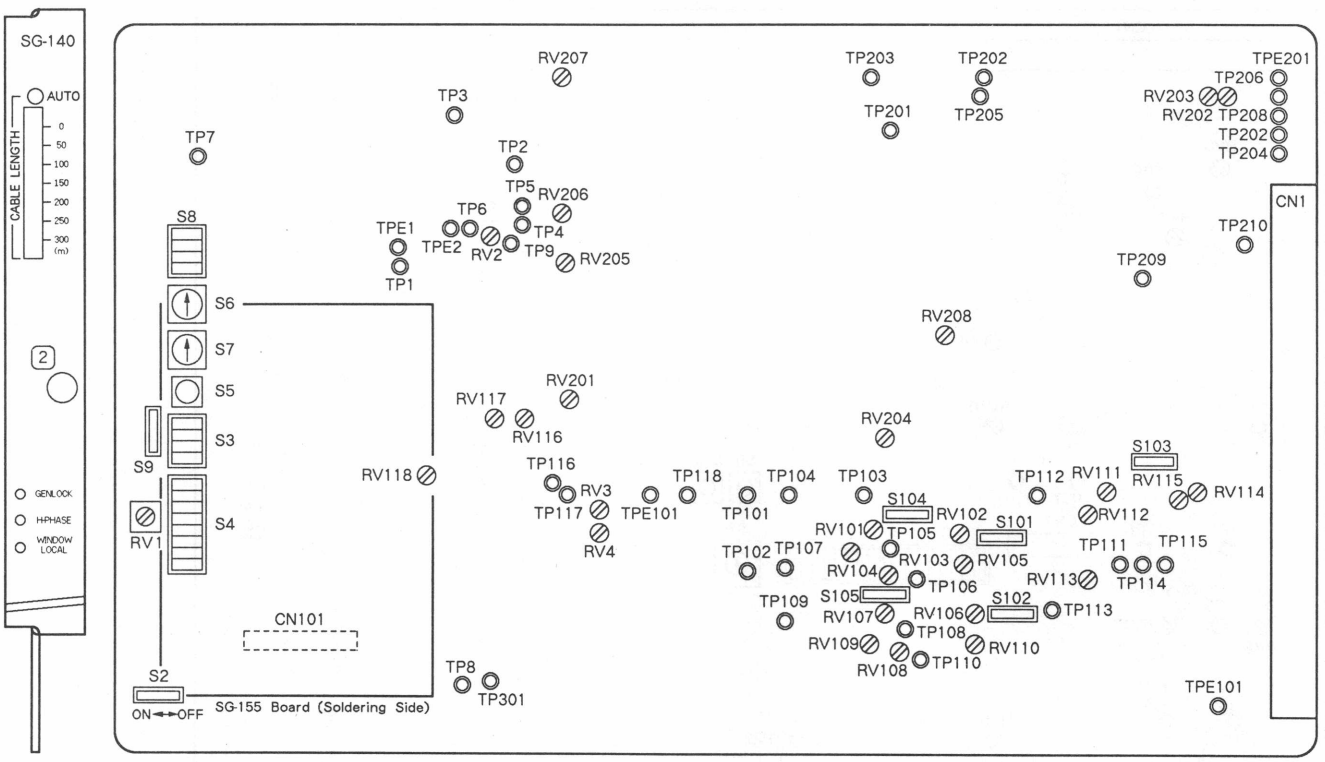


6. Extend the SG-140 board (HDCS).
   - Adjust ⊘ RV112 (CHU 1 BAL)/SG-140 board so that the level at TP112/SG-140 board is 225 ± 10 mV.



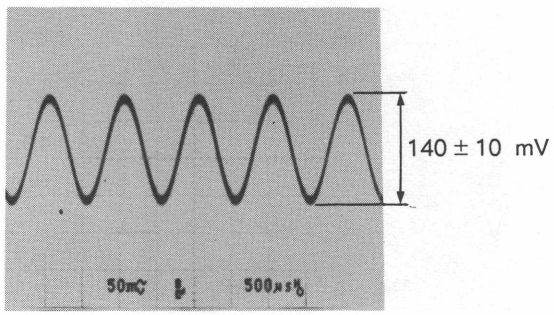
7. Feed the 1 kHz sine wave to the INCOM 2 jack of HDC-300, disconnecting the INCOM 1 jack.
   - Adjust ⊘ RV113 (CHU 2 BAL)/SG-140 board the level at TP113/SG-140 board is 225 ± 10 mV.



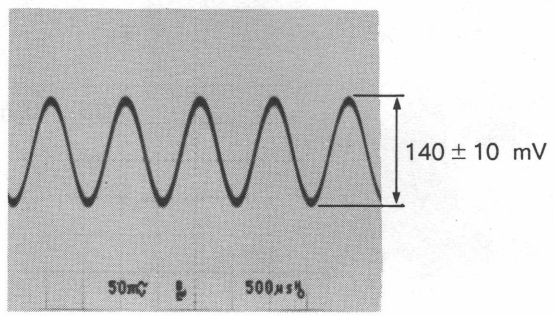


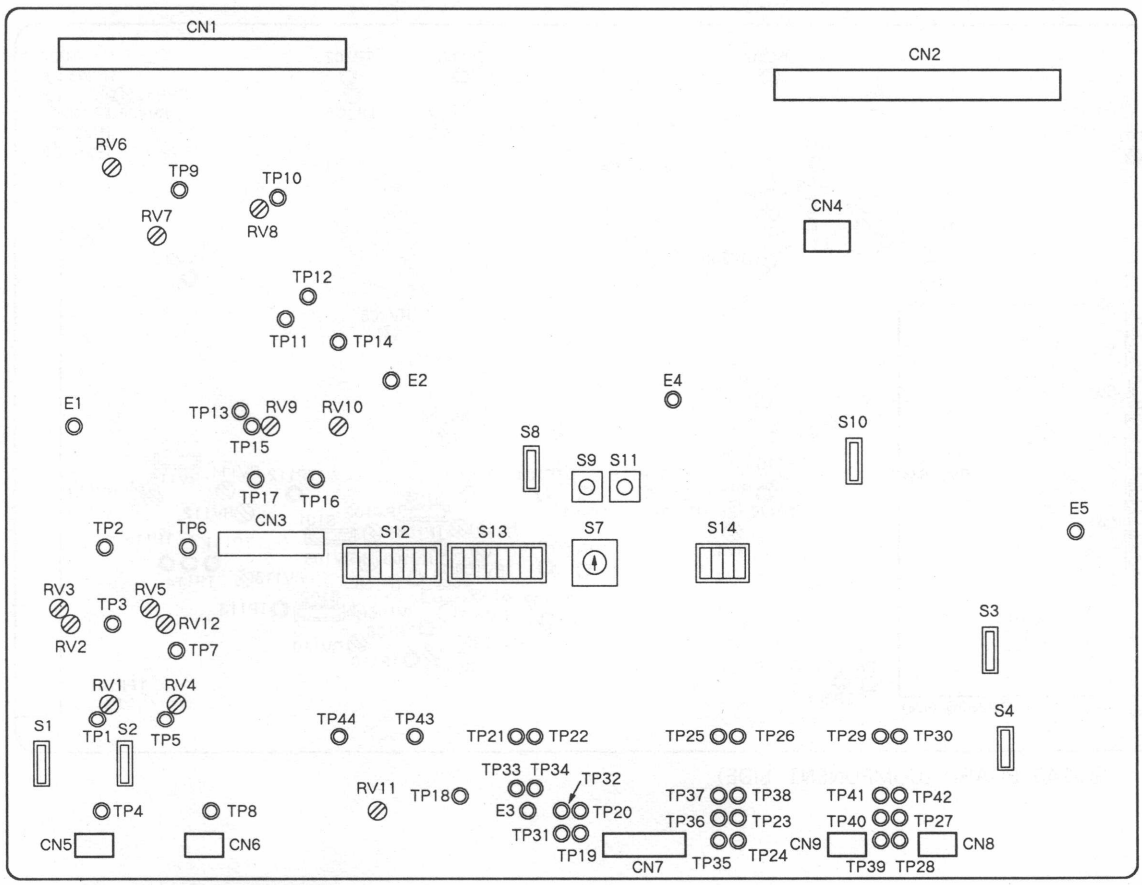
(PANEL SIDE) SG-140 BOARD (COMPONENT SIDE)

8. Open the HDCO operation panel.
   - Adjust ⊘ RV5 (INCOM 2 R-LEVEL)/CP-130 board (HDCO) so that the level at TP7/CP-130 board is 140 ± 10 mV.



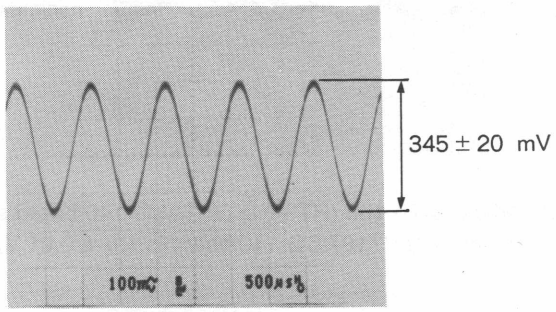
9. Feed the 1 kHz sine wave to the INCOM 1 jack of HDC-300, disconnecting the INCOM 2 jack.
   - Adjust ⊘ RV3 (INCOM 1 R-LEVEL)/CP-130 board so that the level at TP3/CP-130 board is 140 ± 10 mV.



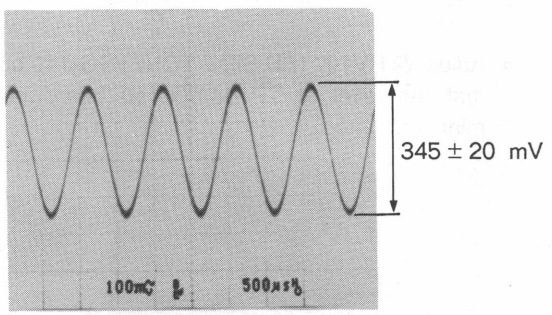


CP-130 BOARD (COMPONENT SIDE)

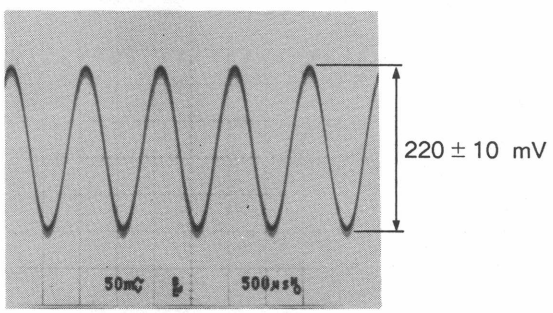
10. Feed the 1 kHz sine wave to the INCOM 1 jack of HDCO-300, disconnecting the INCOM 1 jack of HDC-300.
    - Set ⊘ RV1 (INCOM 1 AGC)/CP-130 board to mechanical center.
    - Adjust ⊘ RV2 (INCOM 1 LEVEL MIX)/CP-130 board so that the level at TP2/CP-130 board is 345 ± 20 mV.



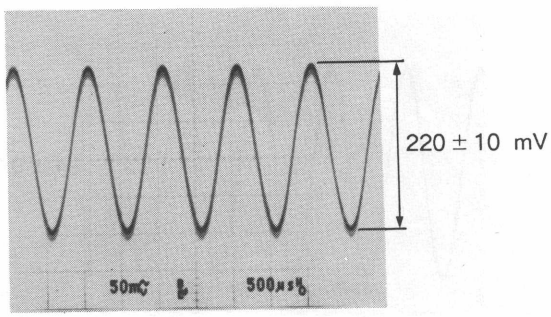
11. Feed the 1 kHz sine wave to the INCOM 2 jack of HDCO-300, disconnecting the INCOM 1 jack.
    - Set ⊘ RV4 (INCOM 2 AGC)/CP-130 board to mechanical center.
    - Adjust ⊘ RV12 (INCOM 2 LEVEL MIX)/CP-130 board so that the level at TP6/CP-130 board is 345 ± 20 mV.



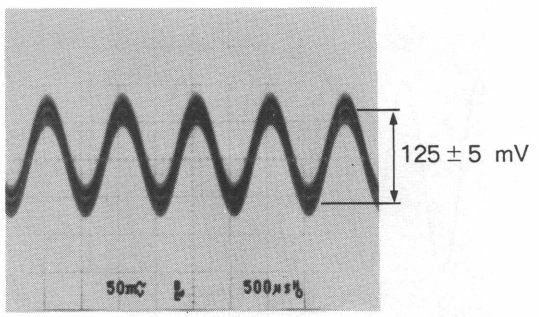
    - Adjust ⊘ RV115 (CCU INCOM 2)/SG-140 board (HDCS) so that the level at TP115/SG-140 board is 220 ± 10 mV.



12. Feed the 1 kHz sine wave to the INCOM 1 jack of HDCO-300, disconnecting the INCOM 2 jack.
    - Adjust ⊘ RV114 (CCU INCOM 1)/SG-140 board so that the level at TP114/SG-140 board is 220 ± 10 mV.

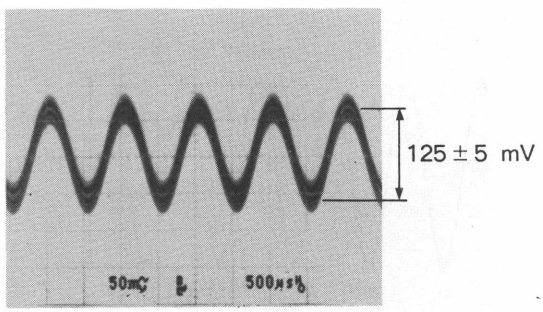


13. Turn on the MIC switch of HDCO-300.
    - Adjust ⊘ RV6 (INCOM 1 GAIN)/SG-141 board (HDC) so that the level at TPB16/extension board EX-188 is 125 ± 5 mV.



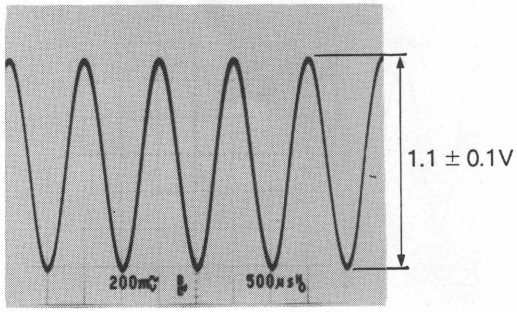
    - Set ⊘ RV10 (INCOM 1 BUZZ CANCEL)/SG-141 board to the position where noise becomes minimum in headset.

14. Feed the 1 kHz sine wave to the INCOM 2 jack of HDCO-300, disconnecting the INCOM 1 jack.
    - Adjust ⊘ RV7 (INCOM 2 GAIN)/SG-141 board so that the level at TPB17/extension board EX-188 is 125 ± 5 mV.

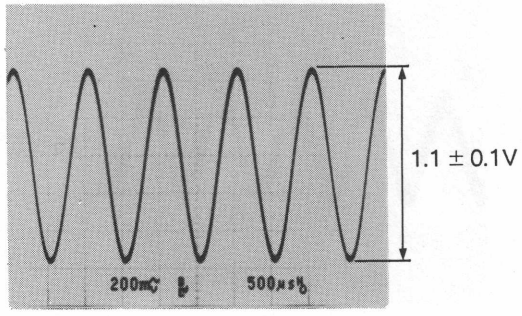


    - Set ⊘ RV11 (INCOM 2 BUZZ CANCEL)/SG-141 board to the position where noise becomes minimum in headset.

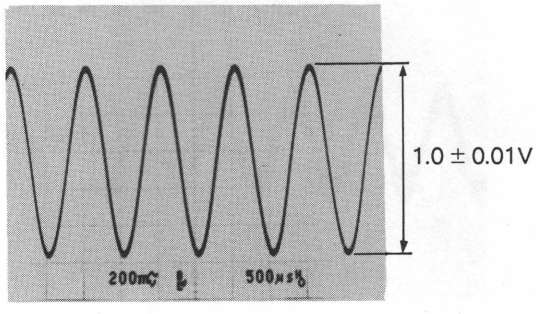
15. Set the INCOM switch of HDCO-300 to COMM position.
    - Adjust ⊘ RV109 (4W PD OUT)/SG-140 board (HDCS) so that the level at TP109/SG-140 board is 1.1 ± 0.1V.



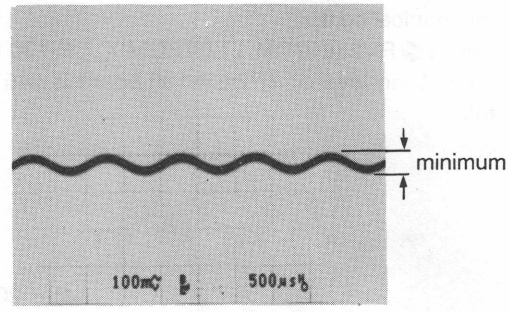
16. Feed the 1 kHz sine wave to the INCOM 1 jack of HDCO-300, disconnecting the INCOM 2 jack.
    - Adjust ⊘ RV104 (4W ENG OUT)/SG-140 board so that the level at TP104/SG-140 board is 1.1 ± 0.1V.



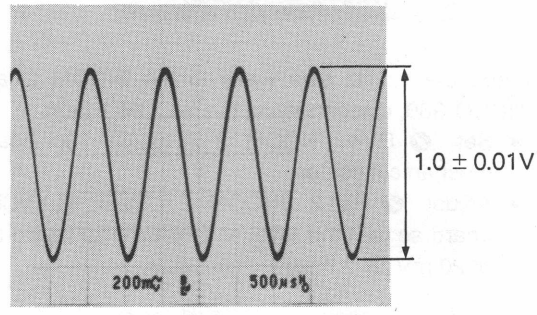
17. Short-circuit between TP32D and TP30D/extension board EX-187.
    - Set the switch S104 (ENG RTS TERM)/SG-140 board to OFF position.
    - Adjust ⊘ RV102 (RTS ENG OUT)/SG-140 board so that the level at TP103/SG-140 board is 1.0 ± 0.01 Vp-p.



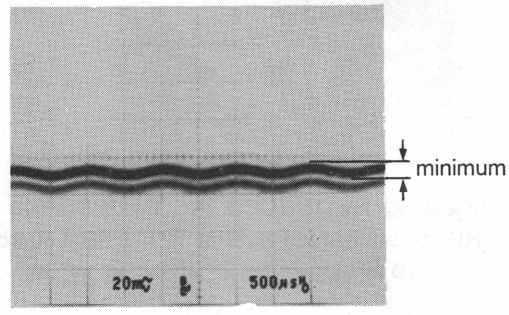
- Adjust ⊘ RV101 (ENG SIDE TONE)/SG-140 board so that the level at TP105/SG-140 board becomes minimum.



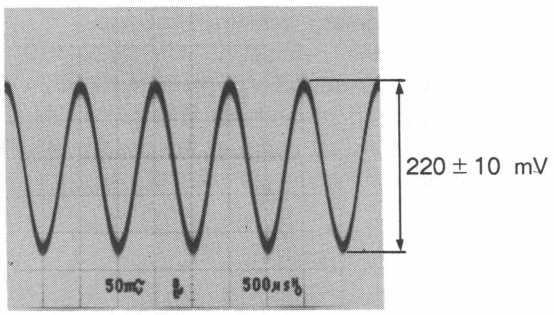
18. Adjust ⊘ RV106 (RTS PD OUT)/SG-140 board so that the level at PT107/SG-140 board is 1.0 ± 0.01 Vp-p.



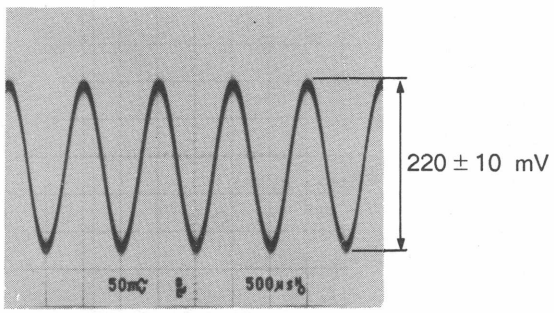
- Adjust ⊘ RV107 (PD SIDE TONE)/SG-140 board so that the level at TP108/SG-140 board becomes minimum.



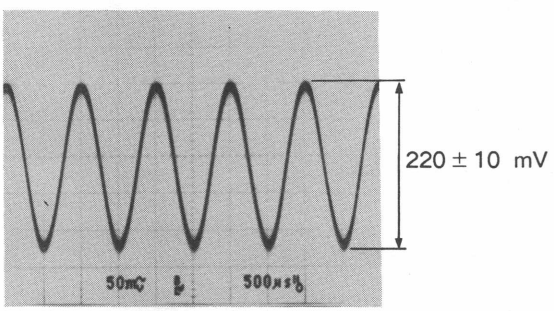
19. Open the connection between TP32D and TP30D /extension board EX-187.
    - Adjust ⊘ RV103 (ENG LEVEL)/SG-140 board so that the level at TP105/SG-140 board is 220 ± 10 mVp-p.



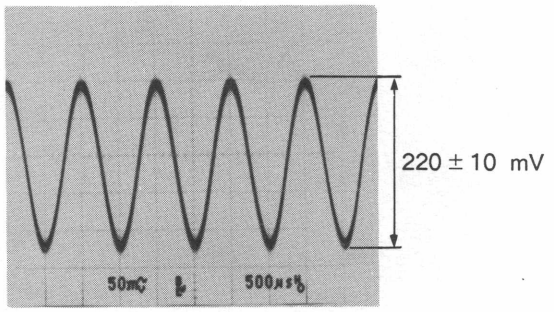
20. Feed the 1 kHz sine wave to the INCOM 1 jack of HDCO-300, disconnecting the INCOM 2 jack.
    - Adjust ⊘ RV108 (PD LEVEL)/SG-140 board so that the level at TP108/SG-140 board is 220 ± 10 mV.



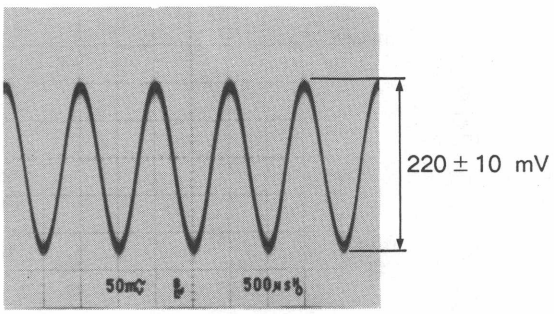
21. Set the switch S104 (ENG RTS TERM)/SG-140 board to ON.
    - Disconnecting the INCOM 1 jack, feed the 1 kHz (2.2 ± 0.2 Vp-p) sine wave to TPB31A (HOT) and TPB31B (COLD)/extension board EX-187.
    - Adjust ⊘ RV105 (4W ENG RECEIVE)/SG-140 board so that the level at TP106/SG-140 board is 220 ± 10 mV.



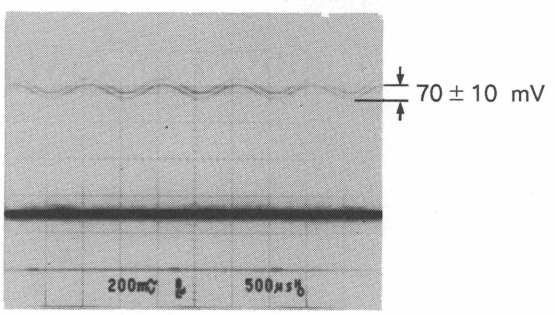
22. Feed the 1 kHz sine wave to TP33A (HOT) and TP33B (COLD)/extension board EX-187, instead of to TP31A (HOT) and TP31B (COLD).
    - Adjust ⊘ RV110 (4W PD RECEIVE)/SG-140 board so that the level at TP110/SG-140 board is 220 ± 10 mV.



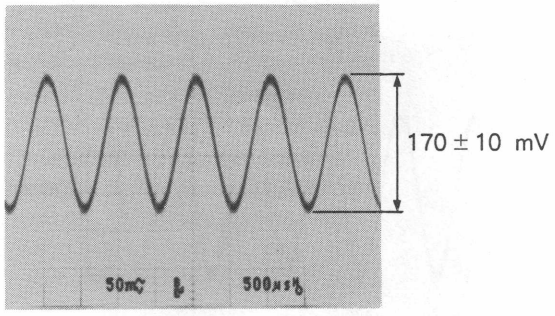
23. Feed the 1 kHz sine wave to TP29A (HOT) and TP29B (COLD)/extension board EX-187, instead of to TP33A (HOT) and TP33B (COLD).
    - Adjust ⊘ RV111 (PGM LEVEL)/SG-140 board so that the level at TP111/SG-140 board is 220 ± 10 mV.



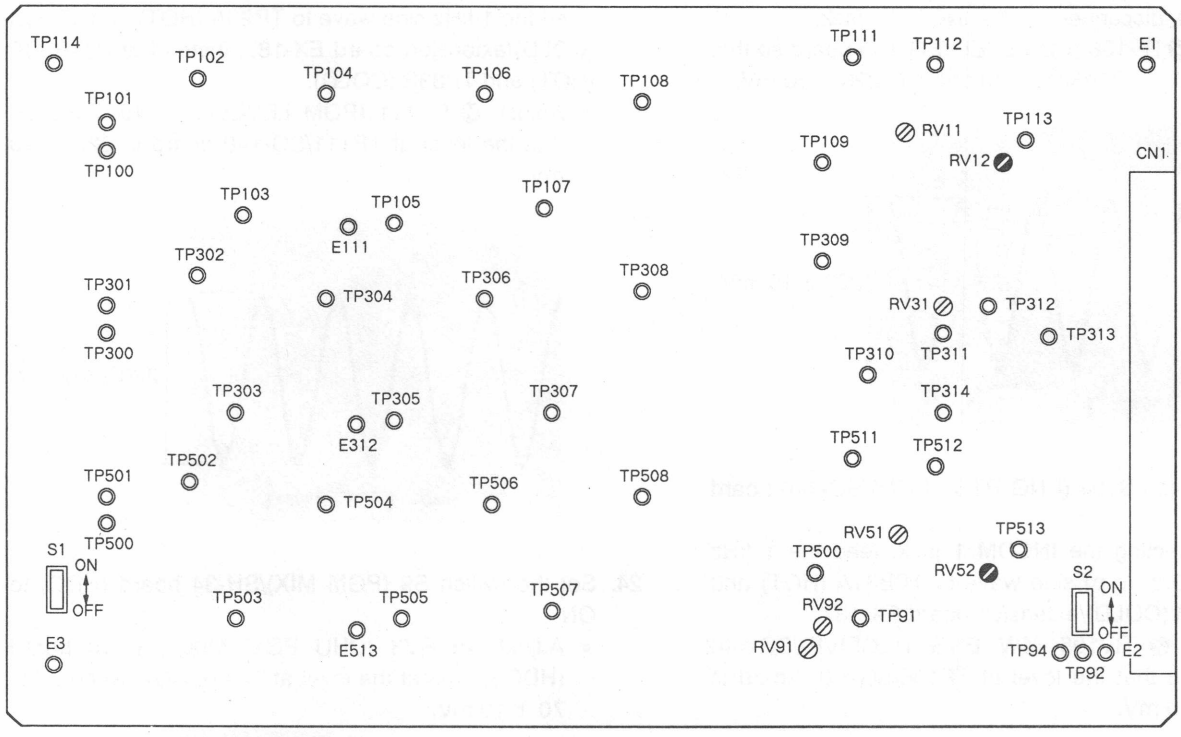
24. Set the switch S9 (PGM MIX)/SH-34 board (HDC) to ON.
    - Adjust ⊘ RV3 (CHU PGM MIX)/SG-140 board (HDCS) so that the level at TP118/SG-140 board is 70 ± 10 mV.



25. Set the PGM MIX switch/HDCO-300 to ON.
    - Set ⊘ RV5 (PGM MIX)/SG-141 board (HDC) to mechanical center.
    - Adjust ⊘ RV4 (CCU PGM MIX) so that the level at TP101/SG-140 board is 170 ± 10 mV.



26. Put the SG-140 board (HDCS) back where it was and extend the IV-18 board (HDCS).
    - Plug in the headset to the INCOM 1 jack of HDCO-300. Set ⊘ RV10 (INCOM 1 BUZZ CANCEL) /SG-141 board (HDC) and ⊘ RV12 (INCOM 1 BUZZ CANCEL)/IV-18 board to the position where noise becomes minimum in headset.
    - Plug in the headset to the INCOM 2 jack of HDCO-300. Set ⊘ RV11 (INCOM 2 BUZZ CANCEL) /SG-141 board and ⊘ RV52 (INCOM 2 BUZZ CANCEL)/IV-18 board to the position where noise becomes minimum in headset.



IV-18 BOARD (COMPONENT SIDE)

HDC-300 (E)
3-693-781-03

Sony Corporation
Communication Products Group

Printed in Japan
1990. 12 09
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